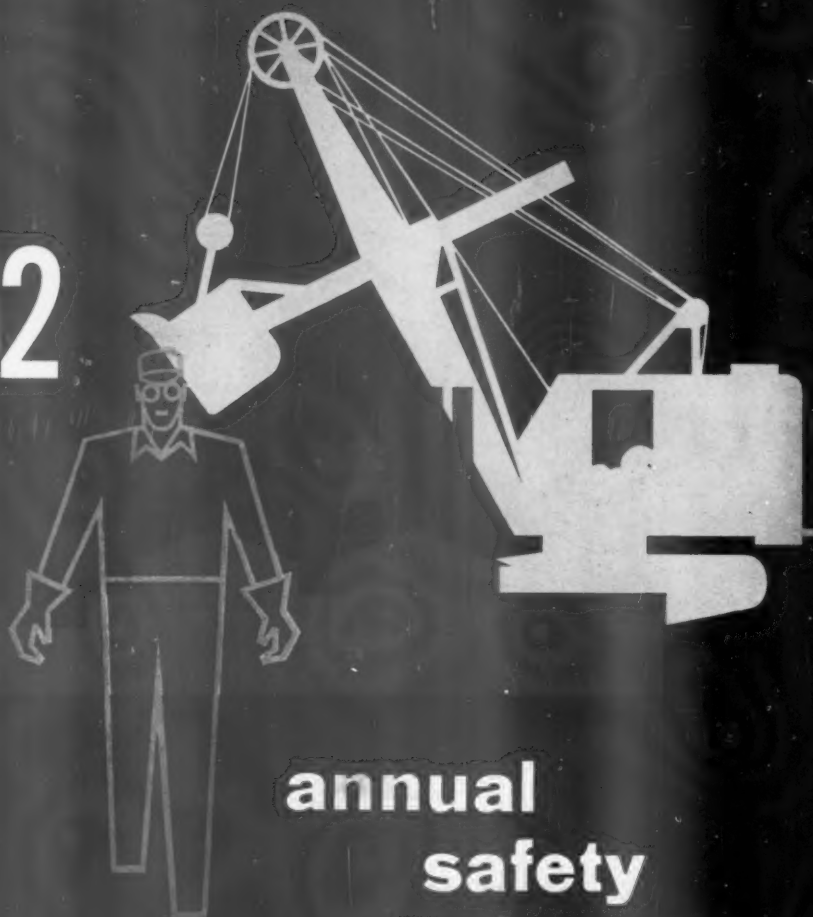


National Safety News

MARCH 1952

1952



annual
safety
equipment
issue

Whatever the Hazard...

it's covered by

M.S.A.

SAFETY EQUIPMENT HEADQUARTERS

Equipment

RESPIRATORS

Air Line
Chemical Cartridge
Cémo Dust
Dustfree #55
Gasfoe
Gas-Pume
Metal-Fume
Paint
Pocket-Type
Ultra-Filter

EYE AND FACE PROTECTION

Acid Hood
Ear Defenders
Eye Shields
Faceshield
Goggles
Paint Hood
Welder's Ear Protectors
Welder's Helmets

VENTILATION EQUIPMENT

Air-Mover
Clean Air Blower
Ventilation Controls
Ultra-Aire Space Filter

ARTIFICIAL RESPIRATION EQUIPMENT

N-H Inhalator
Oxygen Therapy
Pneolator
Pneophore

INSTRUMENTS—DUSTS

Cascade Impactor
Dust-Vue Microprojector
Electrostatic Sampler
Geiger Counter
Midget Impinger

MASKS

Aluminex Mask
All-Service Gas Mask
Ammonia Masks
Chlorine Mask
Heat Mask
Hose Mask
Industrial Gas Mask
Tank Gauger's Mask

OXYGEN BREATHING APPARATUS

Chemox Oxygen Breathing Apparatus
Demand Mask
McCoo 2-Hour
M.S.A. 1-Hour

OVER 2600 ITEMS OF PROVED SAFETY EQUIPMENT

SAFETY CLOTHING

Asbestos Suits
Belt, Safety
Chemgard Aprons, Sleeves
Chemklos
Clothing, Protective
Gloves
Knee Pads
Plastic Clothing
Rubber Clothing
Shoes, Safety

HEAD PROTECTION

Skullgard Hats and Caps
Combination Skullgard-Welding Shield
Coatboard
Fireman's Helmets

INSTRUMENTS—GAS

Aromatic Hydrocarbon Detector
Benzol Indicator
Carbon Monoxide Alarms
Carbon Monoxide Indicators
Carbon Monoxide Recorders
Combustible Gas Alarm
Combustible Gas Indicator
Explosimeter
Hydrogen Sulphide Detector
Intra-Red Liquid and Gas Analyzer
Methane Detector
Nitrogen Dioxide Detector
Oxygen Deficiency Indicator
Oxygen Indicator

FIRST AID

Activol Liquid Soap
All-Weather First Aid Kits
Burn Treatments
FEND Barrier Cream
Fire Blanket
First Aid Cabinets
Foam for Burns
Hand Creams, Protective
Stretchers and Stretcher Outfits

MISCELLANEOUS

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Signs
Edison Electric Cap and Hand Lamp
Fogproof
Ladder-Leveller
Salt Tablet Dispensers

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Sixteenth Annual Safety Equipment Issue

THE ANNUAL SAFETY EQUIPMENT ISSUE is your current guide to the selection and purchase of equipment and products for an effective safety program.

This issue is primarily a reference work. Text has been written concisely to include a wide range of topics in the available space. The descriptions of equipment, the classified lists of manufacturers and distributors and the advertisements supplement each other.

The nine sections cover the main subdivisions of accident prevention, occupational hygiene, plant protection, medical service, and promotion of the safety program and training employees.

These sections, of course, do not represent hard and fast divisions. There are many products which might logically be listed in more than one section. In such cases, the dominant characteristics decided the classification.

Section 1 deals with the plant structure and the features which bring built-in safety.

Section 2 covers plant maintenance and house-keeping, while Section 3 is devoted to the engineering side of industrial health. These three sections are quite closely related.

Section 4 deals with personal protective equipment which enables men to work with a high degree of safety in dangerous environments. It is not a substitute for the long-range safety measures which eliminate hazards at the source, but the value of personal protection in many occupations is immediate and measurable.

Materials Handling, Section 5, is a subject equally important to operating and to safety men. Modern handling methods have eliminated many literally man-killing jobs.

Muzzling power-driven machines was one of the first goals of organized safety work. Section 6 describes some principles of machine guarding, safe use of the main source of power—electricity—and the hand and portable power tools which are essential in so many industrial operations.

Plant protection, principally against fire, is the subject of Section 7.

Section 8, Medical and Health Service, supplements Section 3. It deals with the medical aspects of industrial hygiene and health supervision as well as facilities for the treatment of injuries.

Promoting the safety program—training employees in methods and development of attitudes—needs equipment too. A great variety of advertising and training aids is described in Section 9.

Reference to specific topics will be aided by the cross index on page 8. Each year numerous revisions are made at the suggestion of readers and on the basis of information received from members of the Council and from manufacturers. For this help the editors extend their grateful thanks.

The Safety Library

IN A CONCISE REFERENCE WORK, the material is necessarily limited to basic material of rather general application. For those who wish to dig deeper into the subject, there is a wealth of literature available.

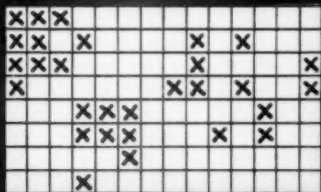
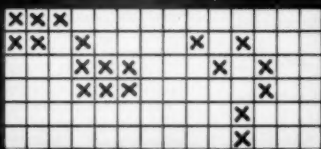
No. 1 volume in any industrial safety man's library is the *Accident Prevention Manual for Industrial Operations*, the second edition of which was published during the past year. This book was consulted frequently in the preparation of the Safety Equipment issue, and it should be added to the bibliography appended to each section.

Periodicals are a continuing source of information on many phases of safety. In addition to those serving the safety field, the trade publications covering specific industries are giving increasing attention to accident prevention.

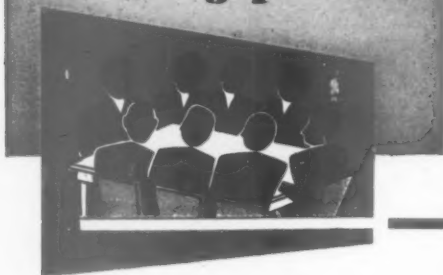
The manufacturers, too, are an invaluable source of information on equipment and products. In safety as in other fields, their catalogs and service manuals are often filled with useful engineering data as well as descriptions of the products offered. After checking many of them for information in the preparation of this issue, we agree with W. Somerset Maugham:

"I would sooner read a catalog or a timetable than nothing at all. They are much more entertaining than half the novels that are written."

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the industrial safety panel



How We Handle Protective Equipment

THE QUESTION:

How is personal protective equipment maintained and dispensed in your plant?

THE PARTICIPANTS:

Martin Cernetisch, safety director, John Morrell & Co., Ottumwa, Iowa.
Frank W. Fiske, safety director, Brewer-Titchener Corp., Cortland, N. Y.

James H. Fogle, safety engineer, mining division, Armco Steel Corp., Middletown, Ohio.

James D. Holtzapple, personnel director, Continental Foundry & Machine Co., East Chicago, Ind.

John E. Kane, supervisor of safety, Ternstedt Division, General Motors Corp., Trenton, N. J.

Paul Kramos, chief safety engineer, Butler Mfg. Co., Kansas City, Mo.

Robert H. Luckenbach, safety director, The Budd Co., Philadelphia, Pa.

J. S. Queener, manager, safety and fire protection division, E. I. duPont de Nemours & Co., Wilmington, Del.

THE SUMMARY:

So far as the individual worker is concerned, the first line of protection against disabling injury is in his personal protective equipment. As a rule, industry follows the reasoning that hazards should be guarded at the source. This guarding program, however, cannot always eliminate all hazards, so the next step is to guard the worker.

An important problem for the safety man, therefore, is to determine the most suitable devices to protect workers against the exposures peculiar to his plant; to stock and maintain these items in good condition; to issue them according to a definite pattern and, finally, to get workers to use them.

Since comfort and convenience of the wearer rank almost as high as protection efficiency, safety directors are constantly on the lookout for

THE INDUSTRIAL SAFETY PANEL is an informal group of safety workers representing various branches of industry. Each month part of the Panel membership answers questions relating to accident prevention principles and methods.

The purpose of the Panel is primarily to obtain the personal views of the members. Statements presented here may or may not be expressions of company policy.

The Panel is conducted by mail and participants have no opportunity to compare notes or sharpen and define points of disagreement.

improved products in this line. And they are supported constantly in this quest by the manufacturers whose research teams and experimental laboratories are striving always for betterment of their products.

Rigid standards are followed in the selection of most common protective items, and adherence to these standards tends to simplify the problem of procurement. But when the stocks have been placed on the shelves of the tool room, stock room or safety department, proper control methods in issuance, cleaning and repair are necessary to their proper use.

This month's Panel reveals the experience of a broad section of industry in developing successful control methods. Here are the case histories:

MR. LUCKENBACH:



All types of personal protective equipment are examined by the safety department to obtain the best articles from the standpoint of wear and protection regardless of cost.

Original contacts with suppliers usu-

ally are made by the safety department. When purchasing departments are offered samples by vendors, the items are always presented to the safety department for test and approval.

We use a term of "Head-to-Toe" safety equipment so as to completely protect any part of the body with devices required. Tests are made by us to determine the protective value, the probable life, and the material from which they are made. This includes the usual known tests on goggles, goggle lenses, respirators, and other body protective devices such as aprons, sleeves, shin guards, spats, gloves, etc.

After we have approved these devices, a standard code number is set up in our main tool stores to identify each item. They are then sent to various tool booths throughout the plant and are issued on "tool checks."

When safety items need cleaning and repairing, they are returned to the tool booth from which they are drawn. The tool booth attendant returns them to the main repair booth in tool stores.

The repairman will replace the lens, head band, nose bridge and side shield of goggles if necessary, sterilize it, place it in a new bag and seal it. These repaired goggles are then transferred from repair booth to main tool stores and re-issued in the same manner as new goggles, etc.

The same procedure is followed on other items including face shields, respirators, safety helmets, etc.

For order purposes and to maintain a stock at all times, our tool division and purchasing departments set up what they call an "alarm point" which shows when a new supply should be obtained.

No articles of protection are purchased by the employees except safety shoes which are available for employees desiring them. We carry a stock of sizes for general requirements and sell them for cost, plus

a few cents for postage and handling. Employees may pay for them in installments.

Where special equipment is required, such as special types of gloves, sleeves, aprons, etc., the safety department requires that a small stock be maintained; but the requisition must be countersigned by a member of the safety department together with the foreman in charge of the job so as to maintain proper control, and prevent piling up too many items.

Some of these items are made in our own experimental division. These include special arm guards, vests, sleeves, aprons, hand pads, etc. A large majority of our hand pads, used over the top of gloves, and arm guards or gauntlets extending from thumb to elbow, are made by an outside company. They have proved very satisfactory in handling sheet metal.

The cost of safety items is never questioned, since injury is so readily avoided through use of such equipment.

MR. CERNETISCH:



All safety protective equipment at our plant is dispensed from one general storeroom. This coordinates the buying, dispensing, sterilizing, and repairing.

One section of the storeroom is occupied by the safety shoe store where a man, trained in fitting, sells safety shoes. These may be purchased for cash or by payroll deduction.

Purchase orders for corrective safety glasses may also be obtained here. The company pays one half of the cost of the glasses and the employee keeps them, even when leaving our employment. All other protective equipment is furnished by the company. This includes mesh gloves, knife guards, hard hats, goggles, face shields, abdominal aprons, gas masks and many other items.

Our method of keeping records has been simplified by standard forms issued by the foreman. The employee receives the equipment and keeps it permanently. This is charged to his account, but the charge is collected only if he leaves our employment and does not return the items.

A loan form is used in cases where a special job is to be done, usually of short duration. Here the employees may obtain tools as well as safety equipment.

Goggle repair work is done by the goggle manufacturer. Mesh gloves are sent to a person who specializes in this work.

Respirators and ammonia masks are maintained on a perpetual basis. They are checked and sterilized and are available at all times.

Sterilizing of protective equipment is done in the general storeroom. All

equipment is cleaned and sterilized before being reissued.

While the storekeeper controls the inventory, there is coordination between him, the purchasing department and the safety director. These three working together as a team control the quantity as well as quality of all safety protective equipment.

MR. KANE:



through the plant protection department.

With the exception of gloves, all types of protective equipment are withdrawn from the cribs as follows:

The foreman fills out in triplicate a "Perishable Tool Order" describing equipment needed. The employee signs the three copies, surrenders the original and duplicate copies at the stock crib where he receives his equipment, and keeps the triplicate copy for his personal record.

Gloves are withdrawn in bulk by the foreman and issued to employees as required.

Personal protective equipment which the employee is required to wear is furnished without cost. However, employees are responsible until the equipment is returned to the crib. In case of loss, the employee must pay the cost. Employees are not responsible for return of perishable items such as sweatbands, hair nets, etc.

The foreman has the following responsibilities:

1. He must recognize the hazard and need for equipment.
2. He must make certain the proper equipment is obtained.
3. He must follow up and be sure the employee makes correct use of equipment.
4. He is responsible for conservation or reasonable use of the equipment.

The tool cribs have charge of all the record keeping and inventory control, reordering as the stock reaches a set minimum.

In order to provide adequate eye protection and to give comfort to the wearers of safety goggles, we have an eye protection room which functions this way:

1. All safety goggles are disbursed from this room.
2. All repairing and sterilizing of safety goggles is completed in this room.
3. Safety goggles are fitted and adjusted to the wearer by a man trained in this work.

When an employee wishes to purchase corrective safety goggles, an instruction sheet specifies the type of goggle (frames, lenses, side shields, etc.) needed for the work he does in this plant. The sheet is signed by the employee and the per-

son who prescribes. After post-infractive fitting by the professional man and after the safety department examines the safety goggles, we refund the employee a part of the cost of the goggles. We check safety goggles through two polaroid films to make sure the goggles are case-hardened.

Since all factory operations have been studied to determine the need of gloves, each foreman has a list of jobs for which we will supply the type of glove needed. The employee does not sign for gloves. Usually the gloves are date-stamped when issued and they usually are also marked with the employee's badge number. Worn gloves must be returned before a new pair will be issued. Used gloves are either scrapped or repaired, laundered and reissued.

On synthetic rubber and leather or leather-palm gloves, we pre-patch the wear points of gloves before they are issued.

When rubber glove fingers wear through, the gloves are repaired by cementing rubber fingers (cut from other worn-out gloves) over the damaged parts. Slits are repaired by cementing patches.

MR. HOLTZAPPEL:



Our safety department is responsible for the ordering and issuing of all personal protective equipment in our plant.

All employees are required to wear safety glasses. We use all types of eye protection. Chippers, burners, welders and open hearth employees are required to wear special glasses suited to their work. All other employees wear regular safety glasses. These are issued by our safety department. Glasses turned in by people leaving our company are repaired, sterilized and reissued.

Employees who work in a dust hazard are required to wear respirators. Each employee has two respirators so that he will be wearing a clean one while his other is being repaired and cleaned. Used respirators are brought to the safety department each day to be repaired, cleaned and sterilized.

Heat treaters, open hearth people and ladlemen are required to wear asbestos clothing on certain parts of their jobs. We furnish asbestos coats, helmets, leggings and gloves. This equipment is kept in the various departments in lockers so that it is readily available. Whenever it is necessary to replace any item, the departmental superintendent requisitions it from the safety department.

Chrome leather spats are furnished for all welders and burners. These are replaced in the safety department

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The Ladies and Efficiency

By BILL ANDREWS

THIS is a story which has been repeated so often in industry that it would be a worn-out theme, except for the fact that it is still happening, and is therefore as new as this morning's newspaper.

The East Imsquinch mill of the Whoopnagel Manufacturing Corp. had always been an all-male show. "This is no needle trades shop," the superintendent used to say. "This is a metal shop, and we do heavy work. And the boys don't want gals around—they'd have to watch their language."

When the last war came, the draft boards and a new airplane plant in West Imsquinch knocked the day-lights out of the labor supply in East Imsquinch. There came a day when Whoopnagel's production of engine components began to sag from sheer lack of manpower to operate equipment.

The industrial engineer they brought in from corporation headquarters looked the situation over and, being unimpressed with local tradition, suggested the employment of women. He then sat back placidly while the super and his staff explained the folly of the suggestion.

After they had talked themselves out, the visitor pointed out that though much of the mill's work was heavy, rough work, a great deal of it wasn't. He read off a list of 20 different operations now performed by 150 men. All of these operations were so light that an undernourished high school girl could handle them, assuming only that material could be supplied to her at work bench height. This supply could be arranged with conveyors in some places, and by the use of rolling stock stands in the rest of the cases.

Some Good Advice

Since the engineer was from headquarters, and since the emergency was genuine, the plant leadership gave in with grave misgivings. They promoted one of the three office girls to the job of assistant personnel manager to advise them.

On one point she was absolutely certain. "You can't advertise for girls and expect them to stay a week unless you do something about the plant washrooms. I've been in the one you propose to change from Men's to Ladies'. Whew!" she held her nose.

The super thought she was exaggerating. It had the best fixtures of any East Imsquinch plant when the building was built—1910. And a washroom couldn't be expected to smell like roses.

"No," said the gal, "but it can be clean—and that one won't be clean as long as it has its present floor. And the fixtures are 32 years old, and, well, some of them are inappropriate for ladies."

The super made the mistake of mentioning this point to his wife and what she told him about cleanliness and other feminine foibles won the battle. The washroom got new fixtures, a tile floor, mirrors you could see in, paint and lights.

This project was completed just about the same time the new conveyors and the rolling stock tables had been acquired and installed. Then the mill advertised for women, and a round half dozen showed up the first Monday.

Two of the six were still on the payroll three days later. And three of the 12 who came in on the two successive days were around when checks were passed out Friday afternoon. But on Thursday and Friday no new applicants showed up.

The Lady Gets Results

The young lady in personnel was green in personnel work, but wise in the ways of women. And she had hastily read a book on personnel management, where she had learned about exit interviews. So she waited upon the super to explain the trouble.

Summed up, her case was:

1. The whole shop was so dirty that a girl couldn't work there without getting grimy in no time, and that meant hard scrubbing with harsh soap at the end of the shift.
2. The smocks the company supplied looked like the Mother Hubbards that 19th century missionaries used on the nude beauties of South Sea Islands.
3. The lunchroom was clean, but ugly, and the menu was almost strictly meat and potatoes, with, at best, some soggy green beans. Salads were almost unheard of.
4. The girls had to share lockers.
5. The flooring of the shop was rough and broken, and the girls, even if they wore moderate heels, were always stumbling, especially where the light was poor.

The super, who had a son fighting in North Africa, delivered himself of an oration about the need for home front sacrifice. To which the personnel gal replied, "These girls who are walking out on us—and the ones they are scaring away from our gate with their stories about conditions—can go to West Imsquinch and make airplanes that contribute just as much to the war effort as our machine components. And they can do it under conditions a girl will accept. They have rest rooms and light and paint, a locker to a girl, and cleanliness."

The super seriously considered firing the personnel gal right then. But, since he was a just man, he decided to look at the aircraft plant first. After that visit he knew he was licked.

"Oh, the heck with it," he explained to his assistant. "The government's paying the bills, and we've got to get the stuff out. We'll go the limit—flooring, lights, rest room, lockers. It'll cost like blue blazes, but it's the war, I guess."

So the mill got its face washed, and a drastic interior remodeling. While the old timers sneered, a generation's soot was scraped off window panes, the concrete mixers poured a new floor slab, section by section. Walkways got special non-slip covering. Cleaning machines were obtained. Beds—not cots—were purchased for a ladies' rest room off the first aid room, and, though this produced deep shudders of horror among the supervisory staff, chintz curtains were purchased for the rest room. And a slack, shirt and cap uniform for gals was obtained, which proved so popular with the girls that they were willing to buy them at cost.

A Successful Program

Step by step, these "frills" brought girls to the plant and held them there. By war's end, production had soared, labor supply was almost adequate, and turnover within bounds.

There had, of course, been some repercussions. The men in the plant almost struck once to back up their indignant demands that discrimination against men be abolished—particularly in the matter of washrooms and lockers. Achievement of equality of the sexes in that respect cost some more money.

Then the stock handling methods installed for women provoked some hard thinking by the more progressive supervisors, and conveyors and other handling equipment sprouted around the mill.

So, when the fall of 1945 rolled around, the super, in another conversation with the industrial engineer from the home office, expressed concern for the future. "It's going to be hard to adjust to a change back," he said. "We're used to the new way now. But we sure can't afford to keep it up."

The engineer shook his head. "You can't afford not to. You think you slicked this place up to please women and thereby have been extravagant. But look here. He pulled out a large sheaf of papers covered with figures.

In essence, these reports showed

—To page 92

Ready for Disaster

Whether the menace is flood, tornado or conflagration, or hostile aircraft, the same measures minimize destruction and panic

ORGANIZED CIVIL DEFENSE is much the same as a safety program.

When industry has an organized safety program, its primary purpose, of course, is to prevent accidents, but if it is realistic it anticipates some injuries. The safety program includes provisions for first aid—to relieve suffering and promote healing, as well as to prevent further damage.

A civil defense program functions principally in this secondary sphere. It cannot, in itself, prevent the catastrophes whose victims it is set up to aid. The civil defense organization cannot prevent an atomic blast any more than it can prevent an earthquake, a blizzard or a flood.

This continent has not yet suffered from attacks by hostile aircraft but it has felt the force of natural and man-made catastrophes. The same preparedness measures are equally valuable in minimizing hazards and preventing panic in all types of disasters.

Therefore, a disaster control organization seeks to control the consequences of disaster—to minister to the needs of its victims. And it must be organized ahead of time—already in existence and functioning when disaster strikes.

Of those plans for disaster relief now in existence, that used in the Los Angeles organization is typical. Most of the fundamentals are covered in the following check list, compiled by the Industrial Indemnity Insurance Company and published in *California Safety News*.

Immediate Plan of Action

1. Plant Defense (Disaster Control) Organization

(a) Appoint plant defense coordinator (PDC) of executive rank, such as safety engineer, plant engineer or plant protection chief. Appoint deputies if more than one shift.

(b) Provide him with staff to cover medical, transportation, fire, communications, personnel, etc.

(c) Include stewards or other labor representatives in early planning; emphasize primary objective of protecting lives and jobs.

(d) Establish liaison with plant personnel, using appropriate channels.

(e) Train and drill the organization so it will function on short notice. Such training should be on company time. Incidentally, the expense of such training is a deductible item under the tax laws, and it may result in reduced insurance rates.

(f) PDC's and their staffs should visit those of neighboring plants, becoming familiar with layouts and arranging for joint action in use of facilities.

2. Medical Survey

(a) Make inventory of available first-aid and medical supplies. List quantities in each location.

(b) List by location available equipment for first-aid and casualty stations, such as chairs, tables, cabinets, beds or cots, stretchers, emergency lights, etc.

(c) Survey available and potential first-aid stations and sites, giving location, size, hot and cold water, toilet facilities nearby, etc.

(d) Survey casualty holding station sites, as specified by area medical director.

(e) Survey personnel to staff emergency medical service. (Properly trained lay people may have to give medical treatment under supervision of physician or nurse when great numbers are victims of disaster.) Such staffs might include physicians not already assigned, nurses, first-aid instructors and trainees, veterans with military medical training as pharmacist's mate, corpsman, etc., and workers with nurse's aide or home nursing training.

(f) Blood-typing program. All workers should carry cards showing blood types at all times.

(g) Survey available vehicles suitable for transporting injured within plant area or to auxiliary hospital, etc.

3. Emergency Medical Service Training Program

(a) Consult American National Red Cross about program best suited to your needs and begin first-aid training program.

(b) Start now on special first-aid instructors' training program.

(c) Start as many workers per shift as possible in first-aid training. Minimum goal for near future: 10 per cent; long range goal: 50 per cent.

(d) Start organizing stretcher teams, rescue teams, first-aid teams and casualty station teams with help of area medical director. For every 1,000 persons, at least two 6-man rescue teams, three 6-man first-aid teams, and one medical team, including a doctor, two nurses and six medical aides.

(e) Drills—announced, then impromptu, to test performance of teams.

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Two-way radio installed by volunteer fire departments of Wayne County, N. Y., to help speed mutual aid and civil defense assignments, has proved valuable in such emergencies as serious automobile accidents. The county has formed a radio network of volunteer fire departments coordinated from Lyons, the county seat, by the mutual aid director for the county. (General Electric Co.)

SECTION 1

Plant Layout and Construction

Planning the Safe Plant

THE MODERN industrial plant makes provision for the safety and health of the employee from the time he enters the plant until he leaves. Architects and engineers have been able to achieve a high degree of built-in safety.

The value of safe, hygienic and comfortable working conditions has long been recognized. Cleanliness, ventilation, good lighting, noise control, absence of disagreeable odors, freedom from physical hazards, and other factors, affect the employee's job satisfaction as well as his safety.

War demands stimulated construction on a vast scale and many improvements were incorporated in these new buildings. Demand for new buildings continued after the war because of shifting population and markets, high transportation costs and obsolescence of existing plants.

Many older buildings are not adapted to modern methods and equipment, particularly for handling materials, which are needed for efficient and economical production in the face of rising labor costs.

It has been estimated that 75 per cent of the industrial plants in the United States are more than 25 years old, and these plants supply a large part of our civilian and military goods. Remodeling, planned by those who understand the industry and its process can put many of these plants on a more efficient basis.

When a plant is in the blueprint stage, features which increase efficiency and safety can be included at relatively low cost. Efficient planning means fewer costly changes in the finished structure.

Building Trends

High construction costs are stimulating the search for economical materials and methods. Newer building

materials, which meet severe performance tests, are sometimes barred by local building codes. Work on standardization of building codes is being conducted by the American Standards Association and other organizations.

One story plants are preferred in many locations where land values are not excessive and there is plenty of room for expansion. Advantages of one story construction are:

1. Lower construction costs.
2. Freedom from stairs and elevators.
3. Ease in routing and handling heavy and bulky equipment.
4. Better lighting and ventilation.
5. Ease in isolating hazards.
6. More efficient handling of materials.
7. Ease of supervision.
8. Lower operating and maintenance costs.
9. Better possibilities for landscaping — an asset where the plant is in a conspicuous position near a main highway or an airport.

Roofs. Keeping the roof flat, or with few projections, is an economy measure. Monitor and sawtooth constructions are becoming less popular although they are effective in admitting natural light to the center of the building. With modern light sources, approaching daylight in quality, this factor has become less important.

"Controlled Conditions." The windowless plant, independent of the outdoors for light and ventilation, and the conventional type of building both offer certain advantages. From the standpoint of safety and employee health, satisfactory conditions are possible with either type.

Visualizing the finished plant. In planning the layout, each operation can be visualized and provided for. The simplest method is by maps and drawings. More effective are block templates and 2-dimensional templates.

Scale models, $\frac{1}{4}$ " to the foot, provide a realistic 3-dimensional picture of the plant. Various arrangements can be made and it is possible to study a manufacturing process quickly and easily. Operations may be combined or simplified and the sequence changed.



Planning tomorrow's buildings. Accommodations for 150 engineers and supervisors in a regional operations center of The Austin Co. Truffer beams formed from heavy sheet steel were suspended directly from trusses and used to support air-conditioning ducts, acoustical ceiling tile, sprinkler pipe, and recessed fluorescent troffer lighting units.

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Plant engineer, safety director and sales engineer studying plant layout and materials handling methods with a three-dimensional layout. (Link-Belt Co.)

Standards for templates and models are being developed by a committee of the American Society of Mechanical Engineers.

General Factors

Before building or remodeling, state and municipal laws and regulations should be checked. These usually cover fire protection, exits, sewage disposal, highway traffic, etc.

Public utility engineers can often give helpful advice to prospective industries in a community.

Type of industry is the major factor in planning the plant's requirements. Even plants in the same industry may have individual problems that involve special planning. Fire and explosion hazards, use of toxic materials, unusual problems of materials handling and storage, are among these factors.

The site. Most people feel that the working day begins when they leave home and doesn't end until they are back home. Tardiness and absenteeism increase when getting to and from work is too difficult.

Cost of operation is affected by the proximity of labor as well as raw materials and markets, particularly in a tight labor situation.

The trend toward decentralization and building new plants in outlying locations involves transportation problems, particularly where transit services are inadequate. Employee car pools have become more numerous and some companies have established private bus service, either free or at a nominal cost.

Topography. Whether the ground is high or low, level or sloping, dry or swampy or undermined must all

be considered in the plans. Normal drainage and the possibility of floods or washouts during heavy rains must also be considered.

On ground likely to be flooded, multi-story buildings have advantages. The upper floors provide a safe place to which valuable equipment and products can be moved.

Waste disposal. Waste and sanitary sewer location is determined chiefly by location of buildings, lay of the land, and maintenance needs. Sufficient manholes or other openings for maintenance should be planned.

Sewers should not be located where leakage might contaminate drinking water sources. In some instances it may be necessary to treat waste material before running it into streams or otherwise disposing of it. In other instances it may be necessary to install special sewerage systems. Federal as well as state and municipal laws may govern waste disposal.

Climate. Industries in colder regions have problems of ice and snow and keeping the plants warm, which may make ventilation complicated and expensive.

In warmer and drier parts of the country some material may be stored outdoors; in others, covered storage may be necessary.

Roof loads of ice and snow and strong winds also affect building design. Where storms of hurricane intensity are frequent, roof anchorage is important. Insurance companies have useful data regarding losses through windstorms and lightning in various sections of the country.

Prevailing winds also affect design and location of smokestacks.

Appearance of the plant—both inside and out—is important. Employee

and community relations are influenced by the looks of a factory, and customers often judge the product by the plant. The housekeeping program should include the entire property.

Landscaping should be planned for economical maintenance. With power mowers and sweepers a small force can take care of a large lawn if it is not broken up by shrubbery and flower beds.

Decorative floodlighting has been employed by companies with distinctive buildings and well-kept grounds.

Protective lighting is important for safeguarding life and property, particularly in times of emergency. Fences high enough and strong enough to deter trespassers are also important in plant protection.

Entering and leaving the plant. Separate entrances and exits should be provided for pedestrians, vehicular traffic and railroad traffic. Entrance and exit gates should be not less than 35 feet from property line structures which might obscure vision. Gates for vehicular traffic should be arranged so that drivers will have a clear view of cross traffic when leaving the premises.

Passenger loading and unloading facilities should be arranged to avoid traffic hazards and reduce the physical effort required to reach the plant. If the plant is on a main highway, space should be provided where buses can at least pull off to the side for loading and unloading.

Where highway traffic is heavy and a large number of employees must be handled, an underpass or overpass will avoid congestion and delay in getting to and from the plant.

Some companies have solved the problem by bringing buses right into the plant. The buses are driven down a ramp to a central location. From there employees reach their jobs through passages below the main production floor.

Parking. The parking lot is an indispensable part of today's plant. It should receive consideration in all plans. If it is necessary to cross a busy thoroughfare to reach it, an underpass or overpass may be needed. Separate entrance and exit facilities should be provided.

Guides and marking aid in proper use of the parking area.

Transportation and Materials

General facilities for moving materials in and out of the plant are railroads, highways, water and air. In a few cases all types may be used but more than two are seldom needed. Loading docks should be planned with consideration for traffic outside and within the plant. Railroad sidings and roadways within the plant add some of the problems of rail-

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Lighting the Workplace

PRODUCTION, safety and personal comfort are all aided by good illumination. The effect on the individual's morale and his attitude toward the job are scarcely less important.

The growing complexity of industrial processes has made the seeing task more difficult. Labor costs have also increased and the investment per worker is greater. These factors have stimulated lighting research with a goal of "seeing comfort" as an aid to efficiency.

To obtain seeing comfort, the lighting system must:

1. Illuminate the work to a brightness which allows the worker to see easily and accurately and to work at an efficient speed without eyestrain.
2. Illuminate work area, its surroundings, and the room generally so that they are free from excessive contrasts, harshness, glare, and disturbing shadows and contribute to a pleasant atmosphere.
3. Supply light of right color and quality so that employees can see and judge appearance details, quickly and accurately.

There are two seeing zones in which brightness should be controlled. The first is the "task zone," which includes the task and its immediate surroundings. Here the work should be illuminated adequately, shadows illuminated or well diffused, reflections from surfaces that conceal details avoided. The immediate surroundings of the task should not be much brighter than the work.

The other and larger zone is the rest of the room. When a worker

looks up from his work, he should not encounter glare from lighting fixtures or from a bright wall or ceiling. Trying to adapt the eyes from light to dark several hundred times each day results in much wasted energy. Visual conditions are reasonably good if the surrounding has a brightness at least one-third that of the task. It should not be brighter than the task itself.

Higher illumination levels throughout the work area and surfaces finished in colors with high light reflectance reduce the glare hazard by reducing the contrast between adjacent surfaces. Light colors on ceilings, walls, floors and machines, kept bright by regular cleaning and repainting, reflect a high percentage of light.

Some directional and shadow effects are desirable in general lighting to accentuate the depth and form of solid objects, but harsh contrasts should be avoided. Clearly defined shadows, not too deep, are helpful in some operations, as in textile inspection.

Illumination Levels

Recommended levels of illumination for a wide variety of operations will be found in many reference works. These include the **IES Lighting Handbook** and manuals published by manufacturers of lamps and fixtures.

Existing levels are determined from readings with a light meter at the spot where light is needed. The eye alone is not a reliable gauge.

For general overhead lighting, levels range from 5 footcandles for inactive storage and passageways to 100 footcandles for high speed

production and highly skilled work.

The more exacting the seeing task the more important it is to get expert engineering assistance in planning the installation.

To insure continued adequate levels, even where conditions are favorable, the system should be designed to give initially at least 25 per cent more than the recommended minimum.

Where dirt collects rapidly and systematic maintenance is not provided, the initial value should be 50 per cent above the minimum.

Supplementary Lighting. Difficult seeing tasks sometimes require more light than can be obtained economically by overhead general lighting. For such work, supplementary lighting fixtures may be used.

Two types of supplementary equipment meet most requirements. Small concentrating projectors increase the general light on the work and provide directional quality.

In fixtures of another type, large area, low brightness fixtures may provide either general lighting for a small area or extra light for critical work, such as inspection.

All supplementary lamps should be shielded, louvered or mounted to avoid glare.

Artificial Light Sources

Three common sources are: (1) Filament lamps; (2) Fluorescent lamps; (3) Mercury vapor lamps.

Filament (incandescent) lamps are available up to 1500 watts for general and special service. There is a type for almost every industrial, public and domestic need. For many purposes its lower cost and greater convenience may offset the higher efficiency of other light sources. No auxiliary equipment is needed; merely a standard socket and available current.

The quality of light is pleasing and most colors look well under it.

Fluorescent lamps have found wide acceptance in industrial lighting. They are two to three times as efficient as filament lamps and have a relatively low heat output — about one-fourth that radiated from filament lamps. This is a decided advantage in air-conditioned interiors.

Fluorescent tubes are best suited for large areas and they should not be mounted too low.

Low surface brightness is one of the important qualities of fluorescent tubes but bare tubes are too bright for eye comfort. Reflectors with louvered bottoms or translucent panels improve diffusion and reduce glare.

Mercury-vapor discharge lamps have high light output per watt, long life, and low operating and maintenance cost.

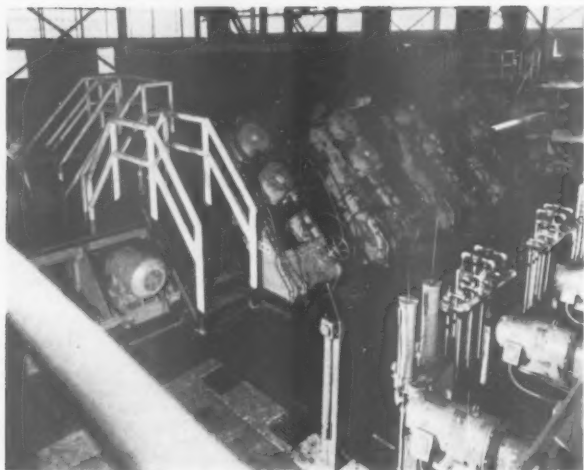
These lamps require auxiliary equipment which makes the initial

—To page 24



Well lighted air-conditioned area in pharmaceuticals plant maintains ideal conditions for packaging sterile products. (Upjohn Co.)

Industrial Floors



Three types of flooring in a steel mill. Grating, checkered metal plate and concrete. Note also crossover bridge, with grating treads and handrails. (National Tube Co.)

FLOORS must support both static and moving loads. They are also subject to impact and abrasion of foot and wheel traffic and the blows of heavy objects dropped accidentally. The surface must offer good traction and resistance to slipping under normal use.

With a floor adequate for expected loads, the next concern is a surface that is durable and safe. Sometimes a compromise between the best material and the installation cost may be necessary.

General requirements. The following specifications are generally desirable, their relative importance depending upon operating and other factors:

General requirements. Various operations make special demands on the floor but the following specifications, or a reasonable compromise, are desirable:

1. **Strength**—Sufficient to carry four times the expected static load or six times the moving load.
2. **Resistance to slipping**—Material should not be slippery nor likely to become slippery through wear or contact with other materials.
3. **Durability**—It must stand up under normal traffic and wear evenly without developing holes and splinters.
4. **Maintenance**—It should be easy to keep sanitary and in repair.
5. **Fire resistance**—Important in most industrial property.
6. **Comfort**—Resilience and low heat conductivity reduce fatigue.
7. **Quietness**—Another aid to reducing fatigue.

8. **Initial cost**—Something that can't be ignored.

Flooring Materials

Each flooring material has its limitations. Some with a high rating for durability and resistance to slipping may be too expensive for general use. These are often usable for limited special areas where a sure footing or resistance to chemical or abrasive action is unusually important.

Smooth, hard surfaces, like concrete, are particularly susceptible to chipping and abrasion. Trucks with steel wheels and heavy falling objects are destructive to the surface. Rubber tires are easier on all floors as well as on the ears.

Concrete is suitable for a wide variety of industrial uses, interior and exterior. It is one of the best materials for damp locations, but does not withstand acids. The floor should be graded to avoid low spots where liquids can collect.

Drains with strainers are desirable where the surface is cleaned by flushing or where there is danger of flooding.

A durable roughened surface, resistant to cracking and dusting, can be obtained by a wood float finish to a mixture of pea gravel, sand and cement. Too smooth a surface is slippery when wet and is actually more tiring to the feet than a rough one.

Concrete is considered too hard and too cold by employees in some locations. Resilient mats of low heat conductivity may be used where

workers must stand in one position for long periods.

Hardening compounds or sealers can be applied to prevent dusting.

Concrete floors can be made conductive and non-sparking with surfacing compounds containing non-ferrous metallic aggregate. This treatment also makes the floor more wear resistant.

For repairing holes and cracks some compounds are superior to concrete. Patching with concrete, even when well done, may crack out under heavy loads.

For painting, a general purpose floor enamel may be used but finishes prepared especially for concrete are more durable. New concrete should be treated with zinc sulphate solution to neutralize alkalinity.

Asphalt (hot mastic) is non-dusting, elastic, odorless, and easily repaired. It is resistant to weather and moisture but is affected by oils, solvents, acids and alkalis. It stands up well under traffic but ordinary grades soften at temperatures above 95 degrees F.

Harder grades of asphalt remain firm up to 158 degrees F. There are also acid-resisting grades.

Asphalt emulsion, sold under various trade names, is made into a mortar with sand and cement and laid cold about one-half inch thick. On a substantial wood base it will carry moderate traffic; with a concrete base it will stand heavy trucking. The surface is somewhat harder than the hot mastic type. It is also affected by oils and solvents.

Mastic flooring materials of other types usually have a resin binder. They are generally resistant to oils, solvents and alkalis, but the manufacturer should be consulted about the exposure. These materials are relatively high in price and are used principally for patching and for resurfacing limited areas.

Ceramic tile is frequently used where oils, acids or alkalies are present and in food product plants where floors must be washed frequently.

Asphalt tile is a resilient material suitable for offices, stores and light manufacturing areas. It is available in several grades—industrial, standard, greaseproof, conductive, and greaseproof conductive. It is moisture resistant but is susceptible to damage by indentation. It is lower in price than most types of flooring. It is non-slippery in its normal state and can be kept in good condition with non-slip floor finishes.

Linoleum is quiet and comfortable underfoot. It is used in offices, laboratories and workrooms where cleanliness is important. Heavy gauge linoleum will withstand loads up to 75 pounds per square inch without permanent marking. Since highly polished linoleum is extremely slippery, the choice of a finish is important.

Stairs and Ramps

Rubber is resilient and has high dielectric strength which is undesirable where static electricity is a problem. Conductive types of rubber flooring are suitable for such locations. Abrasive rubber flooring is useful for stair treads, elevator sills, thresholds.

Wood block is used for heavy duty general purpose floors. A floor of this type is durable, relatively noiseless and does not become slippery or cause fatigue. If blocks are laid on a smooth, rigid base, the floor will stand up under heavy trucking and is not likely to crack. Blocks should be impregnated with creosote for floors in contact with moisture or liquids.

Blocks should be set in high melting point pitch, since ordinary pitch or tar filler may stick to wheels and shoes in hot weather.

Wood plank. Hard, close-grained wood provides a floor that is comfortable under foot and reasonably durable under foot traffic. Under moist conditions, boards have a tendency to swell and buckle. A heavy sub floor enables the surface flooring to withstand moisture and traffic. Under heavy wheel traffic, boards may loosen or break frequently, causing hazardous conditions and excessive maintenance.

Fabric surfacing. Heavy fabric coated with mineral grains is used indoors and out for stair treads, ramps and around machines. The material can be applied to concrete, metal or wood. It comes backed with adhesive which adheres to the surface under pressure. It wears well and is resistant to water, oil and weather.

Steel plates are easily assembled and are serviceable for platforms, stair treads, floors, hatchways. They wear well and are easily cleaned but are highly conductive of heat and are noisy.

The plates are made with checkered extruded patterns which offer good traction and resistance to slipping. When worn, plates can be roughened with a welding torch.

Steel plates are also used over ducts which carry electric circuits or

STAIRS AND RAMPS are important arteries of traffic in plants where operations are conducted on more than one level. Three types of permanent passageway between different levels are: (1) Stairs (2) Ramps or inclines (3) Fixed ladders.

The following general limitations apply:

Stairs are used where the grade is between 20 and 50 degrees from the horizontal. Preferred angle is 30 to 35 degrees.

Ramps and inclines should slope as little as possible; 15 degrees is the recommended maximum.

Fixed ladders are for grades over 50 degrees where stairways are not practicable. Use of ladders as a substitute for stairways is prohibited in some states.

Stairs

Long stair flights are to be avoided wherever possible. Landings every tenth or twelfth tread are recommended.

For grades between 7 and 20 degrees, a combination of stairs and level landings may be used.

Treads and risers. Ratio between depth of stair treads and height of risers determines the angle or pitch of the stairs, which should be between 30 and 38 degrees from the horizontal. Tread depth and riser height must be constant for each flight.

Winders should be avoided. Wedge-shaped treads make it more difficult to ascend or descend safely.

Treads must be deep enough that, in descending the stairs, the ball of the foot does not project beyond the nosing and the heel does not strike against the riser above.

The Building Exits Code specifies that treads of new stairs shall not be less than 9½ inches, exclusive of nosing. The Code also states that no stairs with a tread of less than 6 inches, exclusive of nosing, shall be permitted.

Stairs subjected to severe use, as in public buildings, should have treads with a durable non-slip surface. Materials used for original installation or repairs include abrasive metal, steel with extruded patterns, grating, plastic compounds, rubber and fabric with abrasive surface.

Risers should not be more than 8 inches nor less than 5 inches in height. Greater or less height will cause one to take an unnatural stride which may result in a serious fall.

Railings and handrails. The American Standard Society Code on Floor and Wall Openings, Railings and Toe Boards requires that every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as specified.

Ramps and Runways

Ramps and runways are preferable to stairways when it is practicable to use them. They should be built to the least slope possible. Maximum recommended slope is 15 degrees. A rise of more than 1 foot in 10 is prohibited in industrial plants in some states.

For wood ramps materials used in construction should meet the requirements for scaffolds. Width should be adequate for traffic and open sides should be protected with standard railings 42 inches high.

Toeboards should be installed where the ramp extends over a work place or passageway. Cleats 16 inches apart are needed on steep inclines.

Planks should not overlap and the length of the plank should run the long way of the ramp. Ramps used for wheelbarrows should have an odd number of planks with no cleats on the center plank. The width should be not less than 3 feet.

Ramps made of concrete are preferable for heavy traffic. Anti-slip surface can be obtained by rough floating or by incorporating abrasive in the finish coat. Hardeners and troweling should not be permitted.

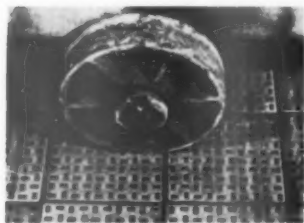
When the surface of a concrete ramp has been worn smooth, it can be roughened by scrubbing with dilute nitric acid. The surface is then hosed to remove all traces of acid.

Ramps used for heavy vehicular traffic, such as power trucks and heavy duty hand trucks, should have solid curbs in addition to the handrails.

Ramps included as parts of aisles and traffic routes should be as wide as the aisle to avoid bottlenecks.

Splinters, nails, irregularities, breaks and cracks in the surface are dangerous and should be repaired immediately.

Outdoor ramps should be kept clear of snow and ice. When necessary, cladders should be applied to give traction.



Concrete floors subjected to heavy trucking may be reinforced and surface-protected with perforated steel floor plates embedded when concrete is poured. (Acme Steel Co.)



Overpass across railroad tracks provides safe access to the plant. The wide stairways are divided by center railings.

Planning the Safe Plant

—From page 10

road and highway traffic to manufacturing operations.

Transportation and material-handling equipment within the plant includes plant railways (standard and narrow gauge), motor vehicles, power trucks and tractors, hand trucks, cranes, conveyors and elevators.

Studies of the flow of materials through the plant, from the time they are received until they are shipped out as finished products, will often reveal ways to eliminate unnecessary handling as well as haz-

ards. Adequate clearances between vehicles and fixed structures must be provided. This is particularly important in laying out plant railways and driveways.

Machine Layout

Machines should be located so that each operator will have enough space to handle the material without interference from other workmen or from machines. It should not be necessary to stand in or near aisles where he will be menaced by traffic or interfere with it.

Movement of both persons and materials should fit smoothly into the general scheme of traffic.

In continuous line operation, where machines are frequently served by conveyors, little or no intermediate storage space for materials is necessary. In other types of operation added space for storage of raw and finished materials is essential.

Work and storage space. Space for the full needs of equipment and operators and for the movement and storage of materials should be provided.

Insufficient headroom is often a hazard. "Temporary" installations of pipe lines, equipment supports, overhead conveyors and other installations that might cause head bumps can often be avoided. Elevation drawings should be studied to determine the exact location of equipment that might cause trouble.

A vertical clearance of at least 7 feet should be provided, especially over aisles, passageways and stairways. Where this is not practicable, overhead obstructions should be marked by contrasting paint or padded to reduce possibility of injury.

Storage space must be adequate to avoid confusion, bad housekeeping, fire hazards, overloaded floors, and damage to stock.

At unloading platforms ample space is needed for handling and storage of incoming materials.

Supplies, tools, safety equipment, small parts, and equipment not used frequently are often neglected in allotting storage space. This makes maintenance difficult, particularly with such items as personal protective equipment, portable ladders, and hoisting equipment.

Hazardous materials. Flammable, toxic or corrosive materials require special precautions in storage. These include solvents, paints, oils, explosives, compressed gas containers, acids and alkalis. Storage of such materials is covered by codes.

Safe access to all parts of the plant should be provided. Stairways, rather than portable or fixed ladders, should be used wherever possible.

Stairs for general use should be convenient to the areas served. They should be equipped with standard handrails and there should be no obstructions at top or bottom.

In-plant traffic. Planning for the movement of power trucks and tractors, hand trucks and tractors in and about buildings requires provision for adequate clearance in aisles, corridors, passageways, and at corners and curves.

Aisleways should be wide enough to permit trucks to pass one another without crowding and without endangering persons working at machines.

Sufficient width should be maintained for free movement of fire apparatus. For one-way traffic, aisles should be not less than two feet wider than the widest vehicle loaded. For two-way traffic, aisles should be not

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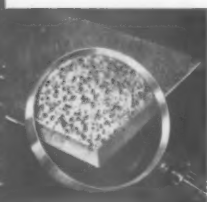
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less than three feet wider than twice the width of the widest vehicle loaded.

Clearance must also be provided for overhead cranes and conveyors. At least 24 inches of clearance should be allowed the highest points of cranes and overhead trestles and other overhead fixtures. Also, 24-inch clearance should be allowed between any part of the crane and wall, column or other stationary structure.

Cross aisles should be avoided at tops and bottoms of ramps and inclines. If possible, aisle and ramp should be in a straight line.

Pedestrian traffic. Aisles should be proportionately wider to accommodate rush traffic flow to such points as time clocks, lunchrooms and exit gates. Some companies provide main aisles up to 26 feet wide and cross aisles not less than 8 feet wide.

Where foot traffic parallels railways or other fixed-track carriers, adequate clearance should be provided to allow the aisle edge to be marked by a distinctive line on the floor. Aisles should always be clearly marked, by painted lines or otherwise.

Gates, warning signals or signs, and barricades should be provided. Where volume of traffic is heavy, underpasses and overpasses for both vehicular and pedestrian traffic should be considered.

Personal Service Facilities

Wash and locker rooms. In large plants where thousands of employees come in through one or two entrances, from which they have to reach distant locations under one roof, the use of distribution tunnels under the manufacturing area is increasing. With such a layout, locker rooms and toilet facilities may be located along the tunnels at points close to each individual department where stairs lead directly to the production level.

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SECTION 2

Housekeeping and Maintenance

The Housekeeping Program

HOUSEKEEPING in industry is not limited to clean-up activities. It is involved in every phase of plant operation, with conspicuous benefits in productive efficiency, sanitation, health, fire and accident prevention and employee morale, as well as in improved appearance.

The housekeeping program includes the entire plant premises, both indoors and out.

Maintaining order and cleanliness is the combined responsibility of management, supervision and employees. The best program cannot succeed without the cooperation of all employees, and this requires constant stimulation.

The plant. A well-designed and well-built plant is easier to keep clean and free from hazards. Some of the essentials are:

1. Aisles clearly marked.
2. Ample room to work.
3. Adequate and convenient storage for materials and tools.
4. Handling material methods and equipment that avoid congestion.
5. Ventilation to remove dust and fumes at the source.
6. Floors and walls that require a minimum of maintenance.
7. Good lighting; well distributed artificial light, and ample window area for

natural light if the plant is not the "controlled condition" type.

8. Personal service facilities: clean, up-to-date washrooms, lockers, and an inviting place where employees may eat lunch.

Organization. Housekeeping has become a science and maintaining orderly and hygienic working conditions requires an adequate crew of able-bodied men. They should be thoroughly trained in their duties and provided with the necessary equipment and supplies.

Equipment

Vacuum cleaners are useful in industry as in the home. Heavy duty types are available in several models with a variety of attachments. In addition to floor cleaning, they remove dust accumulations from corners and from places overhead.

Where dust sources are relatively close together, a piped system may be practical. Cleaning implements are attached to inlets located at frequent intervals. Some hotels, office buildings and factories use this type of dust removal.

For most industrial uses, portable vacuum cleaners are more satisfactory. In most factories the dust sources are widely scattered and the more flexible types of portable equipment meet all requirements.

Floor machines of several types handle the heavier jobs of floor cleaning. With them floors can be scrubbed or dry-cleaned and waxed and polished. Like vacuum cleaners, many types have attachments.

Crusts of dirt, oil and metal cuttings can be removed with revolving scarifying much more quickly and easily than it can be done by hand spudding.

For finer finishing, steel wool rolls are used. Some models have a vacuum pick-up for collecting dust.

Scrubbing, rinsing and drying can all be done by machine with a minimum of interruption of production.

Floor machines may be purchased or rented.

Power sweepers are time and labor savers where large areas must be swept and the litter is relatively light. Some models are also used for sweeping up leaves and litter from the plant grounds and driveways.

Brooms, brushes, mops, etc., are needed in all plants to supplement the mechanized equipment. Tools of good quality are more durable and efficient and they encourage better work.

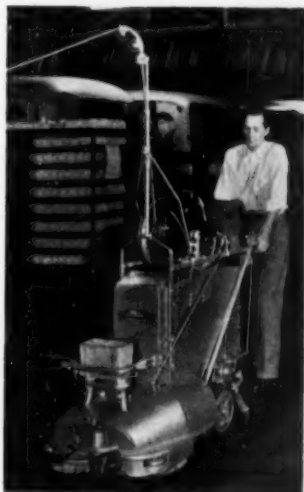
For dry sweeping, a wide cotton mop or a hair broom may be used. Oily mops may leave a dust-catching film.

Aisle marking. Wide clear aisles are signs of a well-kept plant. White lines are constant reminders to keep them free from obstruction and to pile stock within designated areas. The lines can be renewed quickly, neatly and economically with an aisle-marking machine.

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The vacuum cleaner, with its numerous attachments, can be used for many heavy cleaning jobs. Here it is used for sweeping a foundry floor. (U. S. Hoffman Machinery Company)



Floor machines are available in many types and sizes. This one applies cleanser, scrubs, rinses and picks up by vacuum, damp-drying the floor. Machine is self-propelled; speed is adjusted by pressure on clutch lever. (Finnell System, Inc.)

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Color in the Plant

COLOR, scientifically applied, aids safety, efficiency and morale in the industrial plant through:

1. Improved visibility
2. Efficient and economical use of light
3. Providing pleasant and restful surroundings
4. Identification of fire equipment and hazards, also in warning and instructional signs.

Psychology of color. Certain colors arouse mental and emotional responses among people. Familiar colors and the usual reactions to them are:

1. Yellow—Cheering and stimulating.
2. Blue—Cool; desirable where temperatures are high.
3. Green—Restful to the eyes; blue green gives a sensation of coolness; yellow green has more warmth.
4. Red—Danger, excitement.
5. Orange—Combines red and yellow; a bright, warm color which should be used with discretion.
6. Violet and purple—Rich colors implying luxury.

Background Colors

Paint companies have developed color schemes for various types of industrial interiors which conserve light yet provide more cheerful and attractive interiors than the old plan of mill white for ceilings and upper walls and dark colors which do not show grime for dados and machines.

Sharp contrasts in bright and dark areas cause eyestrain because of the continual adjustment of the eye.

White is widely used for ceilings because it reflects more light—80 to 88 per cent. For rooms with low ceilings, or where people frequently look up at them, as in hospital rooms, a color of lower reflectance, such as cream, ivory or sky blue, is preferable.

Colors of high reflectance are also suitable for overhead networks of girders, pipes and other equipment.

Soft tints, such as light gray, pale green and light blue, are suitable for sections of walls in the range of vision. Soft gray, for example, is restful and does not show dust.

A dado extending to the height of work benches and machines, or about

one-third the height of the wall, makes stains, soil and marks less conspicuous. It may be a deeper tone of the color used on the upper wall but should not be too dark.

Floors should have a reflectance value of 25 per cent or more. For machines, desks, etc., 25 to 40 per cent is suggested.

Colors for Machines

To make it easier to see the work and to avoid injury, paint is used to spotlight the point of operation. The body of the machine is painted in one color and the working areas. Four shades of gray, ranging from light to dark, are standard colors for machines. Critical parts should stand out in cream, light tan, or other light contrasting colors.

Light sources and color. Type of light source should be considered in selection of colors. Incandescent lamps tend to reduce strength and intensity of color because of a slight yellowing effect of the light.

Fluorescent lighting is of three types—white, daylight and soft white. Daylight units give a bluish hue and can be used with blue, green and blue-violet. White and soft white units produce a warm light suitable for ivory, cream, beige, rose and tan.

Neutral gray can be used with incandescent, fluorescent or mercury light.

Identification for Hazards

Safety codes for the use of standard colors for identification of equipment and hazards have been developed by the American Standards Association. **Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment Z3.1** specifies uniform colors for marking physical hazards, for indicating the location of safety equipment, and for identifying fire and other protective equipment.

1. Red is recommended for identification of fire protection equipment, and for walls or supports on which extinguishers are mounted; flammable liquid containers (except shipping containers) on which the name of the contents should be stenciled; lights at barricades and danger signs; emergency stops on machines such as rubber mills, wire blocks, and flat work ironers; and emergency stop buttons for electrical switches.

2. Yellow has high visibility and is recommended for marking hazards that may result in slipping, falling, and bumping into objects. Solid yellow, and stripes and checks of yellow and black, may be used to attract special attention. Top and bottom treads of stairways, low beams and



Scientific use of color on both machines and background makes seeing task easier.

pipes and crane hooks are places where yellow may be used.

The combination of black and yellow stripes often is used on mobile equipment, such as tractors and industrial locomotives.

3. Green in combination with white, such as a green cross on a white background, is used to designate the location of first-aid and safety equipment. Location of stretchers, gas masks, and bulletin boards is identified by this color.

4. Black and white, and combinations of them in stripes or checks, are used for housekeeping and traffic markings.

Use of three additional colors is proposed in a revision of this code:

1. Orange has special attention value and is proposed to highlight hazardous parts of machines or electrical equipment, such as exposed cutting edges, the inside of removable guards, and doors and covers to switch boxes.

2. Blue on signs is suggested to designate caution against starting or moving machines being worked upon. Signs would be located at the starting or power sources of elevators, electrical controls, valves, tanks, and similar equipment.

3. Purple is suggested to identify radiation hazards, such as radioactive materials in rooms and containers. **Yellow** is to be used with purple for tags, signs, and similar means of identification.

Types of Paint

Paints, enamels and lacquers provide a medium for the practical application of color. Industrial finishes are often subject to severe exposures and many types of paint have been developed for special needs.

Floor coatings. Synthetic enamels and rubber base floor coatings give better service on concrete than ordinary floor enamels and are more resistant to moisture, acids and alkalis.

Light-colored floors conserve light. They may be stippled with darker colors to avoid glaring contrasts.

—To page 20

PAINT REFLECTION VALUES (New Jersey Zinc Co.)

	Per cent
White	88
Cream	69
Ivory	67
Sky blue	65
Pale green	59
Buff	52
Aluminum	41

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Safe Footing!



Whichever you select—Ferrox, Fera-Mat or Feralun—you can be sure of getting a top-quality, economical safety flooring. Each is first choice of thousands of users. Each is designed to suit particular job requirements. Here are the facts in capsule form:

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Just open the can and trowel it on. Provides non-slip grip . . . resists oil, chemicals and weather conditions. Excellent for machine areas and uneven surfaces. Ferrox gives economical coverage, 40 square feet to gallon . . . costs 1/3 as much as fabric-backed floor coverings.



FERA-MAT

Fera-Mat covers large floor areas in a hurry. It peels like adhesive tape, goes down fast and *stays safe!* Long life is assured through resin bonding agent and diamond-hard mineral granules. Fera-Mat's extra traction minimizes lost motion and fatigue.



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For the toughest jobs, architects, safety engineers and building owners turn to Feralun. These durable treads, plates and thresholds, made of cast iron matrix, have a diamond-hard abrasive in the walking surface. Feralun is low in overall cost because it lasts the life of the building.

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These two proved absorbents, called Quik-Sil and Aqua-Lic, are specially compounded to absorb completely and quickly dangerous oil, grease and water-base substances from floors, thus helping to prevent slipping accidents and fire.

Approved by Underwriters Laboratories, Quik-Sil and Aqua-Lic are amazingly effective absorbents. Quik-Sil absorbs oils, greases, kerosene, naphtha, oleum spirits, gasoline, thinners, and any mineral oil base material. Aqua-Lic dries up water soluble lubricants, water-base coolants, soap water solutions and grinding compound emulsions.

One of the most important features of Quik-Sil and Aqua-Lic is their fire resistant properties. They do not burn. In addition, they make floors skid-proof.

Quik-Sil and Aqua-Lic are ideal absorbents for metal working plants, machine tool builders, aircraft plants, factories, railway repair shops, oil storage rooms, paint shops, car barns, textile plants, shipyards and filling stations.

Free test samples of Quik-Sil and Aqua-Lic are available upon request. Send inquiries on your company letterhead to the manufacturer. The Diversey Corporation, Maintenance Products Dept., 1820 Roscoe St., Chicago 13, Illinois. In Canada: The Diversey Corporation (Canada) Ltd., Lakeshore Road, Port Credit, Ontario.

Another outstanding product you will want to investigate thoroughly is Diversey Elektro-Purj-It. This amazing multi-purpose cleaner is ideal for all general plant cleaning . . . removes dirt and grime like magic and at a cost of less than 2 cents a gallon. Write for free sample.

Color in the Plant

—From page 18

Water-thinned paints. Cold water paints (casein and synthetic resin types) are lower in price than oil paints and satisfactory for some industrial interiors. They can be applied with spray-coating equipment. They are washable but less durable than other types of paint.

Luminescent materials (paint, tape and plastics) become luminous in complete darkness after exposure to natural or artificial light.

Fluorescent materials glow only while exposed to ultraviolet light. There is no usable afterglow. These materials are used where it is desirable for the eyes to be adapted to darkness, as in instrument dials, night flying and driving, and where electric power is available for producing light. They enable the operator to observe readings without glare or eye fatigue.

Phosphorescent materials glow after exposure to light and remain luminous after the light is extinguished. They are observed best under total or near-total darkness. The low intensity of the glow makes them suitable only for close viewing in darkness.

Reflecting coatings and buttons are effective where headlights, flashlights, cap lamps and similar sources of light are available.

Rust prevention. Paints which form a tight bond with clean metal offer considerable protection against rust and corrosion. When rust has started, ordinary paint is ineffective because corrosion will continue under the paint film. Rust-sealing coatings, both clear and pigmented, are often helpful.

Identification of Piping

The American Standards Association's Code Scheme for the Identification of Piping Systems recommends use of the basic colors of red, yellow, etc., in a simplified plan for piping systems. The code does not apply to pipes buried in the ground, pipes used in electric conduits, or piping which carries solids either in gas or air. Contents of pipes are classified as follows:

Classification	Color
Fire protection	Red
Dangerous	Orange or Yellow
Safe	Green
Protection materials	Bright blue
Valuable materials	Purple

(Use of orange, blue and purple has not yet received official approval.)

The color may be applied the entire length of the pipe or in bands 8 inches to 10 inches wide near valves, pumps, and at repeated intervals along the line. The name of the specific material is stenciled in black at readily visible locations at



Keep all Walkways Slip-proof with

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The Non-Slip, Brush Applied
Abrasive Floor-Coating



Horn Tread-Sure produces a heavy long-wearing anti-skid surface on wood, concrete or steel. Tread-Sure is an abrasive filled brush-coating, simple and inexpensive to apply on any size area.

Tread-Sure is resistant to gasoline, alcohol, oil, grease, detergents, industrial waste and many types of acids. Tread-Sure provides a non-skid safety footing, giving the worker confidence and security by reducing accident hazards.

Tread-Sure maintains traction and resiliency and is comfortable to stand on. Designed for exterior as well as interior use, it may be brush applied over other paint or direct to unpainted surfaces. Used as it comes from container. Three non-glare colors—Battleship Grey, Red, Green.

Uses for Tread-Sure

Steps and stair treads
Aisles—walkways
Ramps—gangplanks
Grease racks—work benches
Running boards
Washrooms—showers
Elevator floors—landings
Machinery platforms
Scale platforms
Foot pedals
Decks—hatch covers

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For all types of industrial installations . . . Molded rubber treads in black or marbled colors give lasting SAFETY with quiet cushion and beauty. . . . Apply permanently to any type step—wood, metal, concrete, tile with Melastic water-proof bonding cement. Riser and landing coverings available in colors to match. Treads supplied trimmed to fit any step need. . . . No cutting or waste.

LINK MATS — A Type

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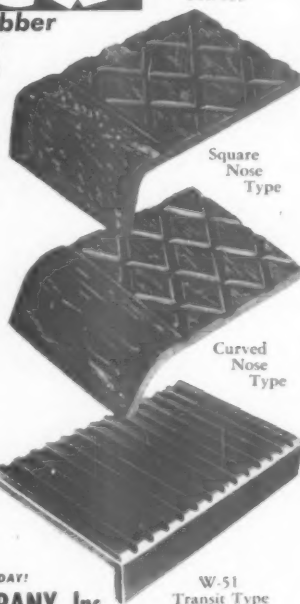
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Laboratories, Inc.
S.A.-833

valves, pumps, and similar places.

Color stripes painted at the edges of the color bands may also be used to identify the exact contents of lines, but this is less satisfactory than stenciled identifications. Labels for marking piping, which conform in color and size of letter to the code, are on the market.

Acids and alkalies cause many paints to change color. Paints exposed to moisture and chemical action should be carefully selected.

Industrial Floors

—From page 13

pipe lines. They can be removed easily for servicing equipment underneath.

Magnesite is suitable for light traffic. It must be laid on a rigid base and should not be used where there is excessive moisture or hydrostatic pressure, as in basements. A coating of bituminous paint is necessary to protect pipe and other metal objects since magnesite corrodes some metals. It is resistant to oils.

Terrazzo floors are durable and easily maintained. The mixture can include abrasive aggregates to provide a non-slip surface. Sealers make it impervious to most acids. Where there is excessive foot traffic, as in building lobbies, rubber mats are used to reduce slipping hazards and protect the surface.

Lead is used for floors exposed to acids and as an inset or mat for secure footing in operation of wood-working machines or other places where the results of a slip and fall would be unusually serious. Lead is conductive of heat, nonsparking and quiet.

Zinc is also used for its nonsparking qualities in such locations as compounding rooms where fire and explosion hazards exist. Zinc is attacked more readily by acids and alkalies.

Cork tile is quiet and resilient and has high anti-slip and insulating ratings. In dry locations it stands up well under light traffic. It is expensive for most industrial uses but it will reduce damage to dropped tools and materials.

Abrasive metal plates are used for thresholds, elevator sills, stair treads, and other locations where a durable, non-slip surface is essential. These plates with abrasive particles incorporated in the surface are available in both steel and non-ferrous metals.

Conductive floors are important in the control of static electricity where explosives are manufactured or where flammable gases, dusts and vapors may form explosive mixtures. Conductive floors ground static electricity and stray currents.

PLANT HOUSEKEEPING

Check Card—General Conditions

Keep it clean and keep it orderly. CHECK:

- FLOORS ☐ Dropped objects picked up
AND ☐ Scrap pieces in box
STAIRS ☐ Oil, grease spills wiped up
☐ Stock material out of way
- ☐ Good foundation—straight sides
PILES ☐ Layers cross-tied
☐ Break-down from top
- ☐ Trucks
AISLES ☐ Hose and electric cord } not in
☐ Ladders, boxes, etc. } aisles
- ☐ Oily clothes and rubbish out of locker
LOCKER AND ☐ Floor dry and clean
WASHROOM ☐ Newspapers, lunch scrap in waste can
- ☐ Flammable waste in covered can
FIRE ☐ Fire equipment not blocked

(See other side)

SAFETY INSTRUCTION CARD No. 29
National Safety Council PRINTED IN U.S.A.

Types of conductive flooring include lead, spark-proof mastic, magnesium oxychloride, conductive linoleum, conductive asphalt tile and conductive rubber.

Floor mats often reduce slipping hazards and provide a more comfortable footing on hard, cold or damp floors.

Mats are made of wood, rubber, neoprene, and vinyl plastic. Neoprene, with cord-on-end construction, is satisfactory where the mat is exposed to oil and grease.

Mats should preferably have beveled edges or be set flush with the floor.

Grating. Metal grating is often used for platforms, stair treads, catwalks, etc., both indoors and out. They provide good traction and sure footing, even when wet and greasy. They are practically self-cleaning since they do not retain dirt and snow. One type uses twisted and slightly roughened bars in construction; another uses heavy expanded metal with cross grooves.

Bridge plates (gang planks) are used to bridge the gap between a box car or truck and a loading platform. They are made of wood, steel or light metals (magnesium or aluminum alloys). Either material is acceptable.

Anti-slip coatings may be applied to many surfaces with brush or trowel. These are available in several colors. They have varying resistance to oil, solvents, dilute acids and other destructive agents.

Maintenance. All breaks in a floor should be repaired promptly to avoid an immediate tripping hazard and the possibility of major repairs. See Section 2.



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makes these
spots safer, too!



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wet or dry... helps prevent costly
lost-time accidents!

Paint those slippery danger areas in your plant or building now with FROST'S SURE-FOOT Non-Slip Abrasive Paint. This new paint cuts losses due to slips and falls when applied to steps and stairs, aisles, inclines, loading platforms, and many other danger spots. SURE-FOOT Non-Slip Abrasive Paint is amazingly economical—costs just a few cents a square foot—and pays off in fewer injuries and improved working conditions. SURE FOOT'S special formula assures long dependable service under heavy foot traffic and light-wheeled vehicles.

FROST'S SURE-FOOT PAINT comes in four modern functional colors in non-glare finishes—gray, red, black, and green. Water, oil, grease, or other liquids cannot penetrate this protective paint. Fire-retardant, too!

ADAPTABILITY — SURE-FOOT is easily applied to any size area. It adheres equally well to steel, aluminum, wood or concrete surfaces.

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EASY TO APPLY — App'y like ordinary paint. Dries overnight to tough, non-slip finish.

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Frost PAINT AND OIL
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Light

—From page 11

cost higher. Restarting time is relatively long. Color of light is less pleasing than that from most other sources.

For high bay mounting where work areas are large and maintenance difficult, mercury vapor lamps are frequently used.

For rough work, as in steel mills and foundries, they may be used alone. Where color discrimination is important, alternate fixtures of mercury and incandescent lamps are used.

Several types of mercury vapor lamps are available. The pressure at which the lamp operates accounts in large measure for the color of the light produced.

Reflectors. Lamps used without reflectors waste light and may cause uncomfortable or dangerous glare. Many types adapted to the light source and location are available. Factors to be considered in choosing the type of unit are:

1. Distribution of light and suitability for the interior.
2. Efficiency of light output.
3. Sturdiness of construction.
4. Adaptability if more light is desired.
5. Economy of cleaning and replacement.

Reflector lamps are advantageous where dust, fumes and other conditions make maintenance difficult or costly.

Natural Light

Whether to design a plant to make fullest use of natural light or to depend largely or wholly on artificial light, is primarily an economic problem. Light of satisfactory quality and quantity can be obtained from either source.

Side windows alone are inadequate for lighting extensive areas, even in bright daylight. Sawtooth, monitor or skylight windows take full advantage of natural light but add to the cost of construction and maintenance.

Glare may be subdued by glazing windows with refracting or diffusing glass which will alter the direction of light and improve its distribution, particularly to distant parts of the room.

Translucent coatings for windows on the sunny sides of buildings are also helpful in reducing glare.

Reflection of daylight from sources outside a building can often be utilized. Light colors for faces of structures, walls of courts, and sawtooth roofs are helpful. These surfaces should be kept clean and free from sources of glare.

Sudden transition from bright to dim areas in a plant is hazardous. While the pupil of the eye is adjust-

—To page 28



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UNDER
WET SHOES**

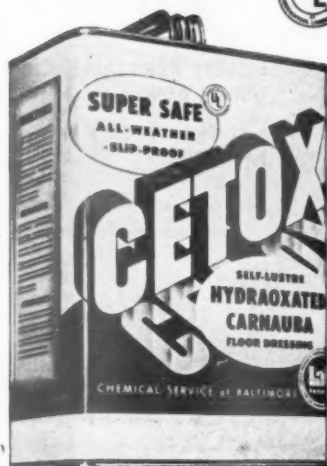
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SAFE TO WALK ON, SAFE FOR FLOORS

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the Hydrooxated carnauba
floor dressing that's extra safe all year 'round!



CETOX makes all floors super safe—especially throughout year's 30% inclement weather when the risk of slips and falls is greatest.

Super safe—even under wet shoes

Normally, water underfoot acts as a lubricant. CETOX is extra safe under spilled or tracked in water. You simply won't slip, because

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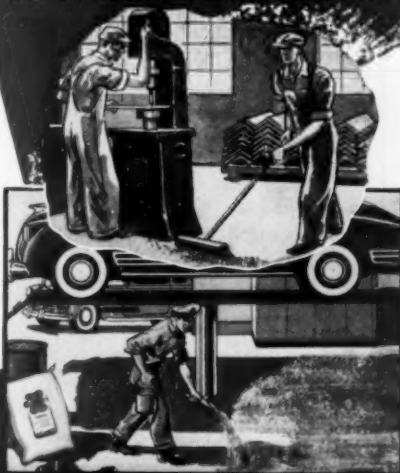
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Light

—From page 24

ing itself to the dimmer light there is a period of semi-blindness. Gradations of light at the approaches to areas of different intensity will avoid this trouble.

Special Lamps and Fixtures

Where lighting equipment is required for special uses or subjected to abnormal conditions, many types of lamps and fixtures are available.

Glow lamps are used as signal, pilot and night lights. They are not practical for general illumination.

Vibration-resisting lamps give greater service where ordinary lamps would have a short life because of excessive vibration.

Weather-resistant lamps are used for outdoor lighting in industrial plants, docks, athletic arenas, etc. They stand exposure to rain, sleet and snow without cracking.

Explosion-resistant fixtures are used where dusts, gases, fumes and vapors may create a hazardous atmosphere.

Infrared lamps, available in types and sizes up to 1000 watts, are used for baking, drying and heating processes, as well as for therapeutic use.

Maintenance

Efficient lighting requires a systematic maintenance program. Equipment may meet all requirements when installed but dust and grime immediately start reducing light output.

The first step in a maintenance schedule is to check illumination periodically with a light meter. When light has decreased to 75 per cent of its original value, the lamps and reflectors should be washed with warm water and a detergent containing no free alkali.

Group replacement of lamps, both filament and fluorescent, is often practicable and desirable. The saving in cost of replacing a large number of lamps at one time is greater than the value of the remaining light output of the lamps. Point of replacement.

—To page 30

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- Color in Industry—Data Sheet D-Gen. 44, NSC.

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TEXINOL: An all-purpose concentrate for surfaces which cannot be harmed by water. Cleans thoroughly, economically, leaving no slippery film on floors.

CLEANER #1: A primary cleaner for vigorous scrubbing before polishing. A concentrated paste compound that cannot mar surface or bleach color.

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TRAFICO CLEANER: A slip-resistant solvent that prepares floors to be polished with **TRAFICO**. Removes dirt, old wax and rubber burn marks.

SPIRICO CLEANER: A slip-resistant solvent that prepares floors to be polished with **SPIRICO**.

Other cleaners available for specific requirements.

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LECO: For linoleum, rubber, asphalt tile, cork, linoleum, similar resilient floors. Gives high slip-resistant finish despite attractive gloss. Protects floors with durable film. A water-emulsion polish.

SAFCO: For asphalt tile floors. A water-emulsion polish with higher slip-resistance for harder surfaces. Apply either **LECO** or **SAFCO** with a mop.

TRAFICO: For wood, cork, linoleum floors. A solvent, tough-wearing polish, ideal for heavily trafficked floors. Slip-resistant.

*All Legge polishes are listed by Re-examination Service of Underwriters' Laboratories.

SPIRICO: For wood floors. A spirit polish that buffs to a smooth sheen. Dust resistant. Provides unusually high safety factor.

FLOOR SHINE: For terrazzo, marble, travertine, quarry, tile, other hard-surface floors. Combination cleaner and slip-resistant polish. Also effective as secondary maintenance on other polished floors.

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Light

—From page 28

ment is usually 60 to 80 per cent of the rated lamp life.

Disconnecting hangers permit lowering fixtures to the ground or floor for cleaning, relamping and repairs. Much climbing is eliminated.

Emergency Lighting

Where failure of the power system might endanger life, an emergency lighting system is desirable. In some states it is required under certain conditions.

Searchlights, stationary or portable, which can be concentrated on critical areas, are often desirable for outdoor use.

Portable systems, mounted on trucks, can be moved to the scene of a fire or accident to aid fire-fighting and rescue work.

Protective Lighting

Outdoor lighting for the safety of employees or to detect trespassers is required by most industrial plants. Where work is done outdoors after dark, levels must necessarily be higher than those needed chiefly for plant guards to spot intruders and detect unusual activities and conditions.



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Light sources should be shielded and aimed so that the guards can see clearly at all times. Light can be directed to form a "glare barrage" in the direction from which intruders might approach the plant.

Work Furniture

WORK FURNITURE, well designed, prevents much unnecessary work fatigue. For health, comfort and efficiency, work surfaces should be of correct height and chairs adjusted to the needs of the individual.

Alternate periods of sitting and standing at work are desirable. Since this is not always practicable, furniture should be planned for maximum comfort and efficiency.

Work benches. Height of work surfaces, such as benches, machines, tables and assembly lines, is determined by whether the worker is seated or standing. Another factor is whether the hands or the eyes are more important to the operation.

Tilted or recessed tables are useful for some operations.

Chairs. Proper height relationship between seat and work is important. Workers differ in height and proportions and seat height should be adjusted to individual needs.

Posture chairs are adjustable for height and also provide back support. Without it, the worker uses much energy just sitting. The back rest fits into and supports the back between the lower ribs and the hips.

The seat should not touch the tendons and blood vessels on the back of the leg just above the knees. Too soft a seat is not desirable. Contour is more important than upholstery.

A posture chair must be adjusted to the individual's needs or most of its benefits will be lost. The user should also be taught to sit properly.

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An ounce of prevention

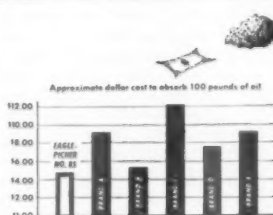
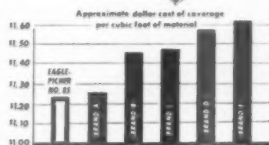
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Portable Ladders

EVERY industrial establishment has operations which involve getting from one level to another. Where frequent access to any location is necessary, stairways, ramps or fixed ladders are desirable.

For occasional access to different points, portable ladders are needed. They are particularly important in maintenance and construction work.

Few accidents are caused by ladders which are defective when purchased. However, mistaken economy sometimes results in the purchase of ladders which are too light or otherwise unsuited to the job. Neglect and abuse of originally sound lad-



Platform or safety ladder.

ders, and unsafe practices by the user are frequent accident causes.

In selecting ladders for industrial use, a reliable guide is the American Standard Safety Code for Wood Ladders, A14.1-1948. Ladders built according to code specifications are plainly labeled.

Metal ladders are not covered by an American Standard Code. However, those marketed by reliable manufacturers meet exacting tests. The Metal Ladder Manufacturers Association, organized in April 1949, has established its own standards for this equipment.

Definitions (ASA)

The following types of ladders are commonly used in industry:

1. Fixed ladder—One fastened to a structure in a permanent position.
2. Portable ladder—One which may be used at various locations, such as single, extension, step, and trestle ladders.
3. Single or straight ladder—One consisting of but one section.
4. Extension ladder—One consisting of two or more sections traveling in guides or brackets so arranged that it may be adjusted to different lengths.

5. Stepladder—One having treads and so constructed as to be self-supporting.

6. Trolley ladder—One running on or in a track, fastened overhead, the plane of the ladder being at right angles to the line of motion.

7. Side-rolling ladder—One riding on a guide rail, generally fastened to shelving, the plane of the ladder being also its line of motion.

8. Sectional ladder—One consisting of two or more sections so constructed that the sections, when combined will function as a single ladder.

9. "A" or Trestle ladder—One consisting of two single ladders hinged at the top to form equal angles with the base.

10. Extension trestle ladder—One consisting of an "A" ladder with an additional single ladder which is adjustable vertically and provided with a lock to keep it in place.

Materials and Construction

Wood, which meets the requirements of weight and strength at moderate cost, is the most widely used material. Acceptable kinds and grades of wood are listed in the Code.

Ladders may have either spreading or parallel straight lines. They may also have sides flaring at the base to increase stability, and converging at the top for specific uses.

Light Metals. Alloys of aluminum and magnesium alloys are light in weight and resistant to moisture. In case of overload there is deflection warning instead of sudden breakage. Prices are higher than for wooden ladders.

Metal ladders should be examined for sharp edges and burrs on the side rails and for soft metal rivets that might shear off under load.

All metal ladders are conductors of electricity and should not be used around electrical equipment. Decals or painted warnings against such use should be carried on all ladders.

Single, extension and stepladders and planks, stages and hangers are available in light metals.

Types of Ladders

Single ladders, extension ladders, stepladders and platform ladders are to be found in most every industrial



Stepladder with rung back.



Extension ladder and ladder shoe.

plant. For more specialized uses there are trestle ladders and telescoping ladders and towers.

Single ladders up to the maximum length of 30 feet specified by the Code are made. Extension ladders are preferred for sizes larger than 24 feet because of transportation and storage difficulties.

The sectional size of side rails must vary with the length of the ladder and the diameter of the rungs must vary with the width of the ladder between the side rails. The diameter of the rungs should not be less than 1½ inches and that of the tenon not less than ¾ inch.

Others' ladders should be provided with hooks at the top so the ladder may be securely fastened to overhead shafting.

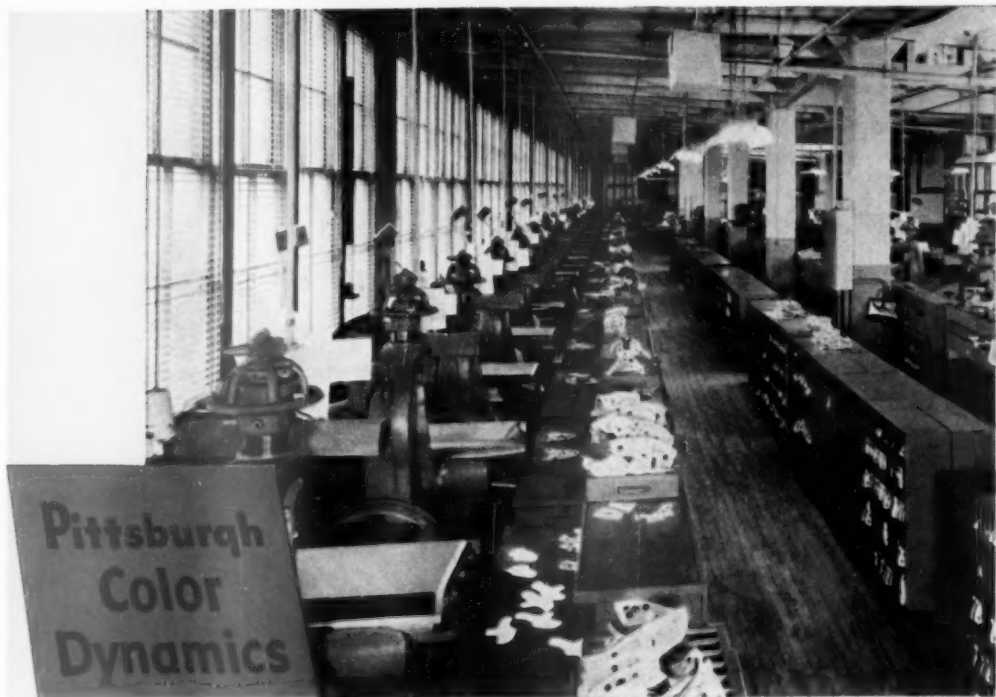
Extension ladders should be equipped with two automatic locks. In the automatic lock the keeper is forced by a spring to grip properly and to seat under the rung. For metal parts, steel, malleable cast iron, or other equivalent metal specified by the Code should be used.

A rope hoist for raising the top section is one of the essentials of a good extension ladder. Lower guide irons, not found on many light-duty ladders, are required by the Code.

Stepladders are built in lengths from 4 to 20 feet.

For industrial use they should have side rails at least 25/32 inch (preferably one inch) by 3¼ inches, or 2¾ inches for stepladders less than 10 feet long. Treads or steps should not be less than 3¾ inches wide and should be truss-rodged or braced to the side rails with angle braces.

—To page 35



... contributes to improved production and morale in Nunn-Bush Shoe Plant

BY actual experience with Pittsburgh COLOR DYNAMICS, executives in many plants are finding that color properly "engineered" on machines, walls, floors and ceilings of their plants produces *more work per man-hour and more man-hours per man!*

● This new painting system is based upon the simple fact that the physical, mental and nervous systems of human beings are affected and influenced by the energy in color.

The Milwaukee, Wisconsin, plant of the Nunn-Bush Shoe Company, one of America's foremost shoe manufacturers, is an example of the benefits that result from the use of COLOR DYNAMICS.

● Three years ago this plant was repainted according to COLOR DYNAMICS—walls, ceilings, floors and machinery. Focal colors were used on operating parts of machinery and eye-rest colors on stationary parts to en-

able workers to see their tasks better. Walls and ceilings were finished with morale-building colors to provide additional eye-rest areas. Safety colors were used to reduce accident hazards.

● The benefits to workers and management since repainting with COLOR DYNAMICS are told by Elmer E. Rexin, Nunn-Bush's Maintenance Superintendent: "Formerly machines were dark gray and the work benches were merely shellacked. Since repainting, we have noticed a decided change in the efficiency of our operations and in the morale of our workers."

"The new color treatment reduced eye fatigue, helped to improve the morale and created a more orderly appearance. Our employees became more conscious of cleanliness and each machine operator made great strides to keep his machine neat and tidy. The new color scheme also received many favorable comments from the many visitors who came to our factory."

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REQUIRES ONLY 1 MAN. As your operator guides machine over floor it cleans a path 16" wide... removes up to 20 lbs. or more of dirt per minute. Has ample power for tough jobs.

CUTS DIRT LOOSE, PICKS IT UP. Revolving cylinder instantly shears away hard-packed grease, chips, paint... hurls it into hopper; vacuum controls dust. Does entire job **DRY**; no chemicals or water; no need to rope off areas.

SMOOTHS AND LEVELS SURFACE. Planing action of cylindrical wire brush or Revo-tool levels humps... leaves ideal surface for trucking; will not dig or gouge. Available in 3 standard sizes: 16", 12" and 8". Specify gas or electric model.

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TENNANT Power Sweepers

Used by 15 of the top 20 firms* in the U. S. (and by hundreds of others), Tennant Power Sweepers have a well-earned record for long, dependable service... plus outstanding *cost-saving performance*. We know of no maintenance equipment that pays for itself so promptly.

SWEEPS AN ACRE AN HOUR. With a Tennant Model 36 Sweeper one man sweeps up to 54,000 sq. ft. per hour (open areas)... at speeds to 6 M.P.H. Cleans path 36" wide (48" wide if side brush is also used).

DOES EXTRA-CLEAN JOB. Brush revolves inside vacuum-equipped compartment... whisks up litter and debris; even cleans many cracks and crevices; helps cut costs.

EASY TO USE, TURNS "ON A DIME". With its rear-wheel steering, reversing clutch, etc., the Model 36 is ideal for busy plants. Easier to drive than a car! Gas or battery models; also in 24" unit (see photo).

*Top 20 non-financial firms ("Business Week", 5-12-51)

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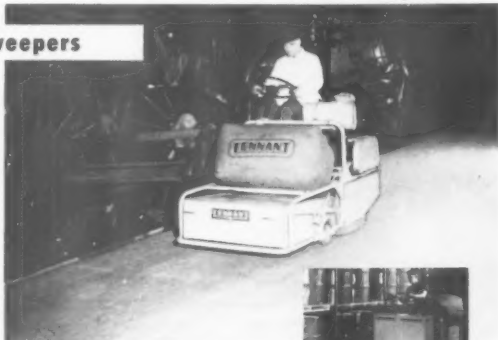
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SEVERAL MEN WITH SCRAPERS, working at top speed, couldn't do the job of this one man—cleaning shop floors with a Tennant "K" Floor Machine. Removes heaviest grime in 1 fast operation, cleaning path 16" wide. Instantly provides clean, dry, level surface. Gas or electric; complete accessories for ALL jobs.



MODEL "J" cleans 12" path; can be used in congested areas.



IT PAYS FOR ITSELF FAST! The tremendous man-hour-savings made by Tennant Model 36 Power Sweepers put it in a class by itself. One big U.S. firm has 69 of them... and one unit paid for itself in 22 days. (Case histories on request.)

Machine has capacity of 54,000 sq. ft. per hour, cleans a 36" path, has combined brush-and-vacuum system for extra clean work. Has 7.3 h.p. engine, drives like a car. Built for heavy-duty work. Now available in GASOLINE and BATTERY TYPE models.



NEW Battery-type Model 36 sweeping warehouse floors.



MODEL "24" sweeps narrow aisles; has big-sweeper capacity.

Portable Ladders

—From page 32

Stepladders should be constructed so that when they are in the open position the front section will have level treads.

Unstable ladders not only invite possible collapse or tipping, but the shaky support they give tends to make workmen nervous and thus more susceptible to accident.

To guard against pinching or bruising hands, the automatic locking device or spreader should have all sharp points removed or covered. The rungback type permits a helper to assist from the back of the ladder.

Platform (safety) ladders offer a solid working platform guarded on three sides. They are of particular advantage on jobs at fixed heights where the work requires considerable freedom for the worker.



Hydraulic stabilizer which keeps a ladder firm and steady in spite of uneven footing. The device can be added to any straight or extension ladder.

Safety ladders are usually built for heavier duty than the ordinary step-ladder.

Height to platform ranges from 3 to 18 feet, the over-all height in each case being 2 feet more.

Trestle ladders of the "A" type (with a center section which slides up and down) are used in maintenance work. These ladders are commonly used in pairs with a stage between them or in sets of four with two stages and with planks from stage to stage.

Points to be considered in selecting extension trestles are guides of adequate length, strong locks of the sliding section, and a safety spreader.

Telescoping ladders are mounted on rubber tired ball-bearing wheels with floor locks. Maximum height of working platform is 15 feet. When

—To page 38



Specialists in Industrial Cleaning Products



Wyandotte Zorball resists breakdown, remains safe in use

Safety engineer says Zorball stops skids, falls—saves absorbent costs!

"WE EXTRUDE aluminum tubing through a hot oil bath," says Mr. A. J. Parker, Safety Engineer of the Reynolds Metals Company in Phoenix, Arizona. "When this heavy 600W oil drips on the floor and cools, it could make footing treacherous and be very hard to remove.

"But we use Wyandotte Zorball to absorb this gummy, sticky oil, because we find that it absorbs without breaking down. That makes it safer to walk on and easy to remove. We also find that we save on material costs."

Does not "mud" or track

Zorball, made only by Wyandotte, does the jobs that other products fail to do, because it does not break down while absorbing. This difference between Zorball and all other absorbents means better traction and no caking, packing, tracking or forming "mud." And Zorball has no effect on

metals, fabrics, wood, rubber or skin.

If you have a problem with waste oil, paint, chemicals or water on your floors, Zorball is the answer. It is the most effective and least expensive method you can use to save man-hours and dollars by preventing accidents due to slipping. Also, it is easy to remove, and protects against fires resulting from waste oil, paints and other liquids.

For details on packaging, shipping and price, consult your jobber or the nearest Wyandotte representative. They will also be glad to give you information on other Wyandotte products that will do restaurant, institutional and industrial cleaning jobs far



better, at lower cost. Wyandotte Chemicals Corporation, Wyandotte, Michigan; also Los Angeles, California.

Largest manufacturers of specialized cleaning products for business and industry



Wyandotte CHEMICALS

Helpful service representatives in 88 cities in the U.S. and Canada

Scaffolds and Staging

SCAFFOLDS and staging of various types are used in construction and maintenance work. The two terms are synonymous, the former being used in the construction industry and the latter principally in shipbuilding.

Accidents involving scaffolds are usually serious because they involve falls of men or materials from high levels. Principal causes include defective materials, improper construction, unsafe practices and physical disabilities of the individual. Men who work at high levels should be carefully selected for the job.

Types of Scaffolds

Many types of scaffolds are in use, including some designed for certain trades. The principal types are:

1. Tubular steel
2. Portable
3. Swinging
4. Suspended
5. Built-up wood

Tubular steel scaffolding is used on large construction jobs where it will be in use for considerable time and where work is carried on at great heights. This type of scaffolding may be purchased or rented. When rented, the contract usually includes erection and dismantling.

Steel scaffolds have low wind resistance and are non-combustible, except for the wood planks. Dismantling is less hazardous than tearing down wood scaffolding. Interchangeable parts facilitate erection and dismantling.

All steel members should be rust-proofed by cleaning and repainting after each job.

Tubular steel scaffolds for use inside buildings are frequently mounted on casters. When casters are included, the base section should be made rigid by additional bracing to tie the bottoms of the upright tightly together. Caster locks should be provided to prevent movement while in use.

Portable scaffolds. Maintenance work in industrial plants and in public buildings is made quicker and safer by portable metal work stands and towers. They provide a broader platform than the platform ladder, permitting more than one man to work and providing more space for tools.

Some types of portable towers are telescoping while others have fixed heights. In addition to the models with four casters, there are work stands of the wheelbarrow type easily moved by one man.

Swinging scaffolds are useful for painting, tuck-pointing, window glazing and washing, and other opera-

tions where the scaffold height must be adjusted frequently as the work progresses.

A swinging scaffold should be securely hung from eaves, cornices, or other reliable support, with hooks of adequate strength. Anchorage should be carefully inspected before the hooks are placed.

Ropes should be of the best grade manila not less than $\frac{3}{4}$ inch, on at least six-inch blocks. Steel cable should be not less than $\frac{5}{16}$ inch. Steel cable is wound on a drum, not pulled by hand.

Suspended scaffolds are supported by outrigger I-beams attached to the frame of the building. They are recommended for use on buildings more than five stories high which have a frame to provide the overhead support. The scaffold is raised and lowered by steel cable operated by a winch.

The shackles or beam clamps holding the cables should be securely fastened to the outriggers with a stop bolt in the outer end of each outrigger. Cables should be securely fastened to the outriggers and to the putlogs which carry the platform or to the hoisting machines.

Built-up scaffolds. Wooden scaffolds are temporary structures and workmanship and materials are often substandard. Attempted economies frequently result in scaffold failures accompanied by serious injuries if not by fatalities.

Lumber for scaffolding should be inspected on delivery and stored where it will be protected from weather.

Specifying a particular grade of lumber may not be practicable since

no one grade will be available in all localities. Names also have different meanings in different sections.

Spruce, fir, longleaf yellow pine, Oregon pine; or wood of equal strength should be used. Material should be straight grained, free from knots, checks, cracks, decay or other defects.

Only the strongest species and grades should be used. In general, the heavier and denser woods are strongest.

Species and grades of lumber recommended for scaffold planks include:

1. Douglas Fir—select structural plank.
2. Southern Pine — merchantable structural longleaf plank and dense structural square edge and sound plank.
3. Larch—structural plank.
4. Norway Pine—select common.
5. Eastern Spruce — select common.
6. Tamarack — select structural plank.

The structural grades of lumber should be used for scaffold planking wherever possible. Where these are not available, each individual plank should be carefully inspected.

No planks of less than 2-inch nominal thickness (1 $\frac{1}{2}$ inch dressed) should be used. Planks less than 8-inch nominal width (7 $\frac{1}{2}$ inches dressed) should not be used.

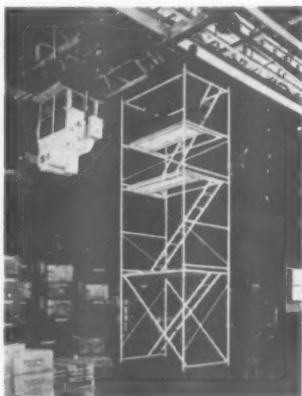
Railings and toeboards. Most codes require railings on scaffolds more than 12 feet high but railings are desirable on lower scaffolds. A top rail should be 36 to 42 inches above the floor with an intermediate rail half way between the top rail and the walkway surface.

Toeboards are needed wherever men are working at elevated levels to prevent tools or materials from falling.

Overhead protection, consisting of planking heavy enough to stop any falling object, should be provided for scaffolds when men are working overhead. This protection should be not more than 9 feet above the working platform.

Sidewalk bridges. Where construction or repair work is carried on over sidewalks, protection for pedestrian traffic is needed. Sidewalk bridges of adequate strength are provided by the companies furnishing sectional steel scaffolding.

Ladder-jack scaffolds are used chiefly by painters and electricians. They should not be used at a height of more than 22 feet above ground or floor and an unsupported span of more than 10 feet should not be used.



Three-section stairway type aluminum rolling scaffold. Top platform is at intermediate level. (Patent Scaffolding Co.)

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Portable Ladders

—From page 55

down, it will go through an ordinary door or into an elevator.

Telescoping towers reach still greater heights. These portable units can be extended up to 49 feet. The man on the platform controls the travel through an electric push-button system. Another push-button control is located on the frame below but the man above can lock the platform in place by pressing a safety button. Outriggers give stability.

Chain and rope ladders are designed for emergency use as a means of escape in case of fire or explosion, and for rescue work where rigid ladders cannot be used. These are not a substitute for permanent fire escapes.

Crow's nest ladders. For many outdoor maintenance jobs the "crow's nest" ladder mounted on a truck is used. It is an extension platform ladder, securely mounted on the vehicle, which can be rotated in a complete circle and elevated at various angles from 45 to 72 degrees from the vertical.

This device permits working over parked vehicles and is used for such



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jobs as tree trimming, servicing street lights, police and fire alarm signals, inspecting overhead lines, connecting house services, and general emergency work. It can be lowered into compact form for traveling.

Ladder Shoes

Whenever a portable ladder is used on anything but dry ground, there is always danger of the feet slipping. To overcome this hazard, several types of ladder shoes have been devised. In general, they grip the surface either by sharp points or by friction.

One type of sharp point is the metal spike; another is the abrasive shoe. The friction type includes those shoes which depend upon frictional resistance for the gripping qualities, such as cork, lead, and rubber or composition with interwoven cord.

Another type made of cotton asbestos material and interwoven wire combines the two principles. Suction cups are used in still another type.

Ladder shoes become less effective through wear, especially when exposed to oil and grease on the floor. Consequently, they should be inspected regularly.

Ladder Maintenance

Inspection. Among things to look for are: Loose rungs or steps; screws, bolts and other metal parts broken or missing; cracked, or broken uprights, braces, steps or rungs; slivers; worn or damaged shoes.

All ladders found defective should be marked and taken out of service and not used until defects have been corrected. If beyond repair they should be destroyed promptly.

Records of the condition of all ladders should be kept.

Storage. Ladders should not be stored where they will be exposed to weather, nor near radiators, stoves or steam pipes.

Protective coatings. Two coats of linseed oil or spar varnish will increase resistance to weathering.

Paint as a protective coating is now permitted by the ASA Code, if the ladders are inspected before painting by experienced inspectors acting for the purchaser and the ladders are not for resale. Transparent coatings, however, are still preferred by many users.

Wood preservatives, which consist of toxic chemicals in non-aqueous solution, prolong the life of wood exposed to weather or in contact with the ground. They offer special protection at the joints or rung holes and tenons. Preservatives of the NSP type (non-swelling, paintable) do not interfere with subsequent painting and varnishing.

"Don't send me

flowers, Boss..



"Just put some Anti-Slip Cosmolite on those slippery floors!"



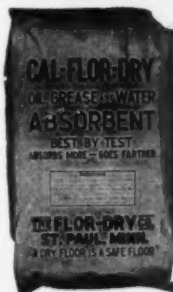
Now you can "cure" those slippery floor problems without special products or costly extra labor. New Anti-Slip Cosmolite does the job in jig time. Protects against floor damage as well as accidents. It's applied quickly like an ordinary self-shining wax. Dries bright and stays that way. Eliminates unnecessary buffing. Resists water spotting. Try it now. Sample sent to you on request.

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The FLOR-DRY Company

Office Layout

FOR EFFICIENCY, convenience and safety, good layout is important in the office as well as in the factory. Many of the same principles of workflow apply equally to both. Light, ventilation, washrooms and other employee services are important for any type of employment.

Housekeeping is important from the standpoint of appearance of surroundings and the consequent effect on morale, as well as for health and avoidance of slipping and tripping hazards.

The following basic details should be considered:

1. Work should flow through the office with a minimum of backtracking.
2. The transportation distance of work should be at a minimum. If possible, desks should be so arranged that each worker will receive his work from the person behind or beside him.
3. Employees using the same machine should be grouped.
4. Noisy machines should be segregated wherever possible.
5. Desks should face in the same direction, unless two employees are working together, in which case they may face each other.

6. Employees should not face the light or any source of glare.

7. Employees who do the closest work should be located nearest the light.

8. Individuals who have frequent callers should be near entrances.

9. Employees should be placed in front of or around the person having authority over them.

10. Aisles should be at least three feet wide; hallways should be at least four feet wide.

11. For desks facing in the same direction, the minimum distance between the back of one desk and the front of another should be 2½ feet.

12. Files should be placed against walls or railings if possible.

13. Exceptionally heavy equipment should be placed against walls or columns.

14. Private offices should be limited. A large open space is better than the same space cut into smaller rooms. It facilitates control and communications, provides better light and ventilation, reduces space requirements, eliminates partition costs, etc.

15. Where private offices are necessary, they should not be so placed that they cut off natural light or ventilation from employees working in adjoining rooms.

16. Special attention should be given to floors to maintain them in a non-slippery condition.

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Air Conditioning for Crane Cabs

Operators of overhead traveling cranes are often subject to extreme heat and humidity, as well as gases, vapors and dust.

To improve conditions, crane cab coolers have been designed. These coolers are self-contained units which need only an electrical connection. They supply clean, cool, dehumidified air to the cab.

These units can also be used to heat the cab in cold weather.

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No. 213P

For large-area, heavy duty scrubbing. Applies the cleanser, scrubs, rinses, and picks up (damp-dries the floor) in one operation. Cleans up to 8,750 sq. ft. per hour! Self-propelled. Total brush spread, 26".



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For small-area buildings with 2,000 to 15,000 sq. ft. of floor. Applies the cleanser, scrubs, and picks up in one operation (quiet vac as in 213P). Cuts cleaning time 2/3! Also can be used for dry work. 15" brush ring.



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100 Series, 3 Sizes

The general-purpose machine that's two sizes in one! Larger sizes can be reduced to smaller units. Low, trailer-type construction permits use beneath equipment. Easy to handle... noiseless. 12, 15, and 18".



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A general-purpose machine of the motor-weighted type. Has 2-way speed reduction (extra protection for motor and gears)... safety switch. The machine is self-propelled... noiseless. 13, 15, 18, and 21".

From the complete Finnell line, you can choose exactly the equipment and supplies you need for most effectual, low-cost floor care. And you can choose with confidence—nearly half a century of manufacturing know-how goes into Finnell products. Finnell makes a score of floor-maintenance machines, including self-powered as well as electric models... also a full line of fast-acting cleansers for machine-scrubbing... sealers and waxes of every requisite type... mop trucks, mops, vacuum cleaners for wet and dry pick-up, applicators for sealers and waxes, steel-wool pads, and other accessory equipment.



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For heavy duty wet and dry pick-up. 12-gal. container. Finish: inside, Vinylite; outside, baked enamel. 7/8 hp. AC-DC motor.



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A mineral oil solvent for machine-scrubbing. Emulsifies grime and grease instantaneously. Cuts operating time of machine.

Finnell Machines can be Leased or Purchased. Leasing budgets cleaning expense. It's also good to know there's a Finnell man nearby to help train your maintenance operators in the proper use of Finnell Equipment and Supplies. For consultation, demonstration, or literature, phone or write nearest Finnell Branch or Finnell System, Inc., 2200 East Street, Elkhart, Indiana.

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Such a safety factor reduces the hazard of falling—lowers accident costs for management.



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HI-LIFT Extension Scaffold

Models extend from 6 ft. 8 in. to various heights up to 26 ft. Hand or electrically operated. Comes to you ready for work—no erection required, no loose parts. Built to meet individual requirements. Ideal for painting, lighting, cleaning, and all overhead maintenance. Pays for itself in time and labor saving.



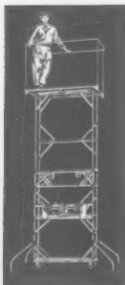
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"The Portable Loading Platform"

- 1 to 3 ton capacity
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- Standard platform 4 ft. x 4 ft.—other sizes to meet your requirements. Electrically operated with either floor or platform control or both. Rugged, all welded steel construction. No strain... no exertion with Atlas One-Man Truck Loader.



High-Voltage Equipment

Special tools and protective equipment have been developed for linemen and generating station employees. Operating conditions vary but certain items are standard.

Tools used near energized equipment should be designed for the job and insulated to minimize the danger of short circuits in the equipment and shock to the operator. Insulation on tools alone, however, is not adequate protection near high voltages.

Items in common use include:

- Linemen's rubber gloves
- Leather protector gloves
- Rubber line hose and blankets
- Linemen's belts and safety straps
- Climbers
- Rubber coats
- Tool pouches
- Tool buckets
- Fuse pullers
- Switch sticks
- Insulated stools
- Switchboard mats

Regular and thorough inspections should be provided for all protective equipment. Any article found defective should be immediately replaced.

Brooms, brushes and other cleaning equipment used around energized equipment should be free from metal. Insulating handles of tools should be kept clean and dry and only non-conducting preservatives used on them.

HILD MAINTENANCE EQUIPMENT

for scrubbing and maintaining floors of all kinds and for scores of other dust-control and clean-up jobs.



HILD Shower-Feed Floor Scrubbing machine with solution storage tank mounted on handle. Used with attachments (below) to scrub, wax, polish, buff, sand, grind or steel-wool floors of all kinds. Six models with brush spreads from 11 to 19 inches.

HILD Standard Floor Maintenance Machine. Used with attachments (below) to scrub, wax, polish, buff, sand, grind or steel-wool floors of all kinds. Six models with brush spreads from 11 to 19 in.



Only HILD has the Patented Shower-feed Brush

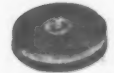
Diagram shows how scrubbing solution flows from tank on handle through accurately spaced holes penetrating the brush back between each row of bristles... for fast, thorough scrubbing with utmost economy. Brushes available with fibre or steel-wire bristles.



HILD Cup Brush for dry scrubbing



HILD Power Scraper for dry scrubbing



Brush for waxing or polishing



Steel-wool pad and holder



HILD Heavy Duty Portable Vacuum

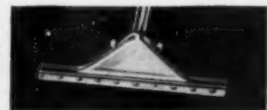


The HILD Vacuum is always ready for any clean-up job... wet or dry. No filter to change... no risk of damaging the machine because a careless or untrained operator has neglected or forgotten the "preliminaries". Moisture or dust in the vacuum air stream can cause no damage to the specially designed HILD Bi-Pass Motor. Easily interchangeable attachments equip the HILD Vacuum for scores of clean-up jobs. Two models... with 10 or 40 gallon liquid capacity.

"DRY-SCRUBBING" FLOORS—Stubborn, hard-caked grease and dirt removed from factory floors with Power Scraper or Cup Brush on HILD Floor Machine. Much faster than chipping off with hand spud, and does not mar floor or loosen wood blocks. Clean, smooth floors speed up plant traffic... prevent accidents.



"SHOWER-FEED SCRUBBING" FLOORS WITH HILD Shower-feed Floor Machine (above) gets rid of the oily, slippery condition that causes accidents. Taking up dirty scrubbing solution with HILD Vacuum (below) gets floors dry in seconds... leaves floors clean and slip-safe. Two-man team with HILD Equipment can scrub floors during working hours without interrupting production for more than 90 seconds. HILD Equipment easily gets around and under machines in close quarters.



SWEEPING FLOOR "WITH AIR". Gets rough factory floors cleaner. Leaves no residue in low spots. Draws dust and dirt out of cracks. No sweeping compound needed.



CLEANING OVERHEAD PIPES. No ladders or scaffolding needed. No need to spar stock or equipment below.



Write today for
FREE
Circular

HILD FLOOR MACHINE CO.
740 W. Washington Blvd.
Dept. NS-3, Chicago 6, Ill.

The Housekeeping Program

(From page 17)

Plastic film tape in white and colors is also used for marking aisles and storage areas. It is said to be durable and resistant to moisture and most chemicals used in industry. Lines can be changed and damaged parts replaced easily.

White, which has been adopted for highway traffic lines, is preferred for floor marking within the plant.

Trash containers at convenient locations throughout the plant help to keep litter off the floor. Containers with self-closing lids are best, particularly where oily rags and waste are stored. Containers may be painted a distinctive color to call attention to their presence.

Steam-cleaning units, which deliver jets of steam and cleaning solution under pressure, are used for cleaning many types of processing and fabricating equipment and removing stubborn deposits of dirt from floors, walls, and ceilings.

These units are available in both stationary and portable models.

Smoking areas are now provided in most plants. Receptacles which will not tip and spill their contents should be provided for cigaret butts and pipe ashes.

Supplies

Development of more efficient cleaning materials has kept pace with improvements in mechanical cleaning equipment. Much research has gone into the development of cleaning methods. Manufacturers can furnish helpful data on housekeeping and maintenance problems.

Detergents. Basically, water does the cleaning. But water alone is not

always effective. It needs the aid of a detergent — soap or one of the newer synthetics. Soap is a detergent but not all detergents are soaps.

There are three types of dirt: (1) Water soluble matter; (2) Oils and greases; (3) Inert solids.

A general purpose cleaner must dissolve, emulsify or suspend the dirt. It must not form a curd when used with hard water.

Soap, although useful, is not a perfect cleaner. Its worst defect is the formation of curds in hard water. Soap is made from animal or vegetable fats which become scarce in wartime.

So-called synthetic detergents are derived from sources other than fats. Petroleum, coal tar chemicals, and by-products of certain industries provide the raw materials. The chemical reactions involved are often complicated.

Alkalis, such as caustic soda, soluble silicates and various phosphates, form the third class of cleaning materials. They are useful for certain types of industrial cleaning where soaps are not applicable.

Care of Floors

All types of floors have longer life if properly cared for. A protective coating of some type is desirable.

Hardwood flooring in its natural state dries out quickly and cracks and splinters under traffic. Scrubbing opens the pores of the wood and excessive moisture causes it to swell. Sealers, varnish and enamels are used as coatings. Sealers penetrate the wood and produce a durable finish.

Concrete may be enameled or treated with a sealer, or with a penetrating dye if color is desired.

Linoleum, asphalt tile and rubber tile have an impervious and decorative surface and care consists of cleaning and preserving this surface.

Wax protects the surface and preserves its appearance. It makes daily maintenance easier by keeping the dirt on the surface instead of being ground into the floor.

Water emulsion (self-polishing) wax can be used with safety on all types of floors. Buffing waxes contain solvents, which injure asphalt tile, mastic or rubber.

Self-polishing waxes are considerably less slippery than buffing waxes. Tests have been made to determine the frictional resistance of various floor finishes on different types of floors. However, it has not been found possible to give any finish a rating which would apply for all surfaces and all conditions.

For floor scrubbing the cleaner



Hydraulically-operated floor scrubbing machine. Loaded hopper lifts to 33-in. clearance and dumps directly into trash disposal box. Steel wire brush shears 36-in. wide path through layers of grease and dirt. Another accessory with tool steel cutters, cuts off hard crusts of paint, tar, embedded metal chips. (G. H. Tennant Co.)

should do the work without leaving a slippery film. Soap is permissible for such surfaces as concrete, common brick, wood block and mastic. For marble and smooth tile a cleaning powder that does not leave a slippery residue should be used.

Strong alkalis and coarse abrasives are injurious to many types of floors, and usually milder cleaners will be effective.

Oil absorbents. Around machines and other places where oil and grease accumulate, hazardous and unsightly conditions develop. Oil spills should be swept up promptly, and the use of a non-combustible absorbent compound makes it easier to keep floors clean.

Absorbents are available in two types—one for oils and grease; the other an all-purpose absorbent where water and other liquids are present. They are much more effective than sawdust, waste or rags.

Tests by Underwriters' Laboratories have rated the effectiveness of these compounds in absorbing oil and grease and from the standpoint of fire safety. They are not subject to spontaneous heating unless the absorbed oil has that quality.

Oil-soaked garments, shoes, ropes and belts can be dry cleaned by burying in the compound.

JANITORS' AIDS

Vacuum Cleaner—Heavy duty with attachments
Floor machine—Sizes, types and attachments for every plant
Brooms, brushes and mops
Cheesecloth
Rubber gloves
Bowl and urinal swabs
Soap and detergents
Disinfectants and deodorants
Wax—Suitable for type of floor



Plastic film tape used for marking aisles and storage areas. It is available in white and colors. Tape is durable and resistant to moisture, acids, alkalis, and most solvents. (Minnesota Mining and Manufacturing Co.)

Plant Maintenance is Safer...

and costs less, too, with

GOLD MEDAL LADDERS AND SCAFFOLDING

GOLD MEDAL LADDERS

—the safest, strongest and best suited to service and maintenance work. GOLD MEDAL Ladders conform to A.S.A. Ladder Code. UL approved.



SAFETY EXTENSION LADDERS

are equipped with automatic safety locks, steel guide irons, riveted metal to metal, and are rigidly braced. 16' to 60'.



SINGLE LADDERS

Made in standard sizes from 8' to 24'.



SAFETY PLATFORM LADDERS

Wide platform, tool rack, rung back, knee braces and truss rods. Sizes: 3' to 18' (height of platform).



UNDERWRITER STEP LADDER

Heavy duty, rung back, knee-braced and truss-rodged. Safety spreader. Sizes: 4' to 20'.



MAGNESIUM LADDERS STEP LADDERS

Weigh approximately 2 lbs. per foot. Sizes: 3', 4', 5' 6', 8', 10'.

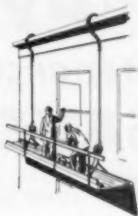
"TUBELOX" TUBULAR SCAFFOLDING

Quickly erected TubeLox Scaffolding (steel or aluminum) is the safest and most adaptable type for interior or exterior work. Only four, simple basic parts are used.

Curved surfaces, uneven ground, etc., are no problem. TubeLox is ideal for rolling scaffolds.



GOLD MEDAL JUNIOR SAFETY SWINGING SCAFFOLD



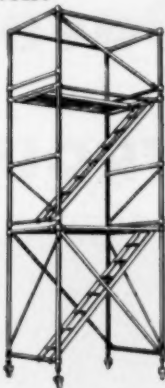
Designed for many light duty operations. GOLD MEDAL Junior Scaffolds eliminate the dangers of rope tackle. 100', 150' and 200' steel cables give extra safety. Machines are triple locked at all times to prevent slipping. UL approved. Midget Safety Scaffold also available—75' cable.

GOLD MEDAL SAFETY EXTENSION TRESTLES



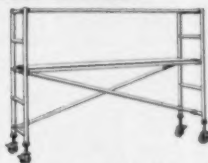
Ideal for painting and general light duty work. Sizes from 6' (extends to 10') up to 16' (extends to 28').

ALUMINUM SECTIONAL ROLLING SCAFFOLDS



The latest in modern scaffold design—light in weight, easy to erect, rigid, cross braced for extra safety. Interchangeable parts permit scaffold of one or more sections. Approved by Underwriters' Laboratories, Inc.

ALUMINUM SECTIONAL LADDER SCAFFOLDS



Readily assembled to various heights using ladder sections 6' 1", 5' 8" or 4' 3" high. Easily moved through crowded aisles or 30" doorways. Can be assembled and taken down faster. Diagonal braces adjust to clear obstructions. Approved by Underwriters' Laboratories. Complete Safety Ladder and Scaffolding Service. Write for catalogs on the complete GOLD MEDAL Line.



For Greater Safety...Efficiency...Economy

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ELECTRICAL WORK



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REPAIRS



Save 5 Ways Safely...

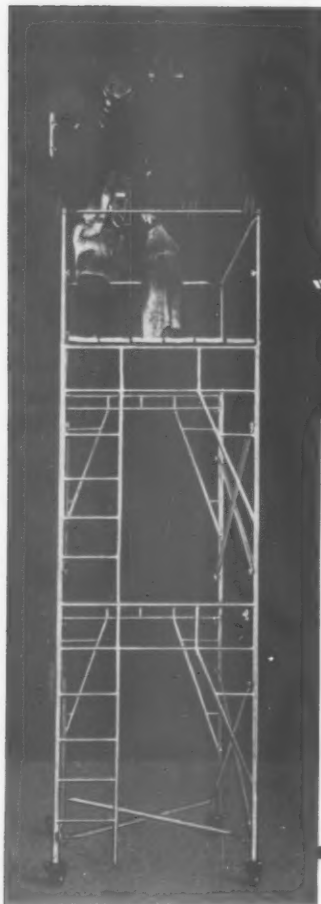
on Maintenance Work with

"TROUBLE SAVER" SECTIONAL STEEL SCAFFOLDING

Simplify plant maintenance. "Trouble Saver" Steel Scaffolds assure greater economy and safety.

- Scaffolding erecting and dismantling time is sharply reduced.
- Men do more and better work on firm, safe scaffolding.
- You protect workers against costly accidents.
- Less labor is required for any job.
- Convenient, efficient scaffolding cuts material waste.

"Trouble Saver" Scaffolding is available in types and sizes for every maintenance need — *indoors or outside*. Write for Bulletin PSS-24 and Catalog M.



"TROUBLE SAVER" Rolling Scaffolds

Left: A typical "Trouble Saver" industrial rolling scaffold, equipped with casters, used for repairs and painting.

Right: "Trouble Saver" LADDER SCAFFOLDING — can be quickly put together from ladder units, 3', 5', 6'-6" or 10' high. Extension bases, 3', 4' or 5' wide are used for working at greater heights.



"TROUBLE SAVER"
Adjustable
STEEL TRESTLES



- SAFE
- STRONG
- ECONOMICAL



Details of the quickly adjustable "Trouble Saver" Steel Trestles.

The Steel Scaffolding Company, Inc.

856 Humboldt Street

Dept. NSN

Brooklyn 22, New York

Telephone: EVERgreen 3-5510

For Safety's Sake Use . . .

DAYTON SAFETY LADDERS AND SHOES

"Listed by Underwriters' Laboratories, Inc."



DAYTON SAFETY LADDERS

Maintenance men everywhere rely on Dayton Safety Ladders for maximum safety and convenience. Dayton's are constructed of tested airplane spruce and reinforced with rigid steel supports to give great strength and lightness of weight.

Handrails of steel guard the large roomy platform for added safety. Half of platform can be raised to form an extra step, when needed. These famous ladders can be set up instantly, are easy to carry and fold compactly for storing. Automatic locking feature insures safety while ladder is in use.

Sizes 3 feet to 16 feet in height with standard rubber safety shoes at no extra cost.

DAYTON "ROLL-ALONG" SAFETY LADDERS

. . . The Dayton Roll-Along Safety Ladder with its rubber tired swivel casters can be speedily moved in any direction with practically no effort.



Safety shoes with renewable treads hold ladder permanently and safely in place while ladder is occupied. Constructed of tested airplane spruce throughout and reinforced with steel braces for additional safety. Folds compactly for convenient storing. Available in sizes 3-ft., 4½-ft. and 6-ft.

Elevating auxiliary platform which folds back in main platform adds height if desired. These ladders are being used in many of America's largest plants. See for yourself! Write today for bulletin.



DAYTON SAFETY LADDER SHOES

fit any standard ladder rails . . . easy to install

Install Dayton Safety Ladder Shoes on your present straight ladders—guarantee additional safety, prevent slipping.

Shoe instantly converted for either indoor or outdoor use.

Shoe or base is made of No. 16 gauge and the side plates are of No. 13 gauge steel. Suction grip treads are renewable. Lock nuts and spring washers insure proper adjustment.

Write today for Bulletin No. D-8

DAYTON SAFETY LADDER CO.

2237 GILBERT AVENUE • CINCINNATI 6, OHIO

In Canada — SAFETY SUPPLY COMPANY — Toronto

Housekeeping

—From page 44

Used absorbents may be used as weeping compounds where the absorbed oil will not be injurious to the surface.

Disinfectants and deodorants are useful, particularly around wash-rooms and garbage cans. They are not a substitute for thorough cleaning with soap or detergents.

Odors may originate in the materials being processed or they may be due to unsanitary conditions. They may not be toxic, but they cause discontent and labor turnover. Every

attempt should be made to remove them at the source but a deodorant may be needed at times.

Sweeping compounds are helpful in keeping down the dust where hand sweeping is used. The combustibility of the compound should be noted for some locations.

Paint. A fresh coat of paint is a tonic to any plant and an aid to morale and housekeeping. Lighting is improved and there is more incentive to keep the place clean.

On machinery light colored enamels have been found practical. They give the operator a better view of his work and encourage more careful maintenance of the machines.

Controlling Air-Borne Bacteria

Control of air-borne bacteria in industrial and public buildings has been the subject of much research. In addition to the personal health aspect, control of such bacteria is sometimes required by manufacturing processes, as in manufacture of food products and pharmaceuticals.

Ultra-violet radiation and chemical bactericides have been found capable of destroying bacteria, although practical methods of application impose numerous difficulties.

Ultra-violet radiation using low-pressure mercury lamps with ultra-violet transmitting glass or quartz envelopes will destroy many micro-organisms. Application is by irradiating the upper air stratum of a room, beaming or screening to provide a narrow barrier of protective light, or inserting a radiation source in an air duct.

Radiations of adequate intensity are dangerous to eyes and skin. Lamps should not be in the range of vision.

Chemical bactericides are also used, propylene glycol being the most effective under most conditions. Effective concentrations are odorless and non-toxic to human beings. Use of chemical bactericides requires close control of humidity in the area to be protected.

Ladder Safety

BEGINS HERE WITH . . .

Safe-Hi LADDER SHOES

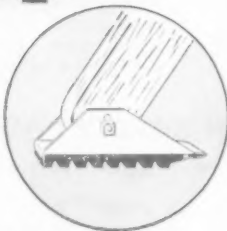


No ladder is safe if it can slip. Safe-Hi Ladder Shoes give four-way protection against accidents:

- ① Rubber in the tread holds on any dry surface.
- ② Cord fibers in the tread hold on wet or oily surfaces.
- ③ Ridges bite through and scrape off foreign matter for firm grip.
- ④ Self-sharpening spike holds on ice or snow.

The hard tool steel spike core is welded to walls of softer steel which wear away more rapidly, making Safe-Hi Ladder Shoe Spikes self sharpening. Quickly attached to standard wood or metal ladders.

See your safety dealer or write



SPECIFY

Safe-Hi
PRODUCTS

and get that
extra safety margin

ROSE MFG. CO.

710 Club Bldg., Denver, Colo.

• SAFETY BELTS • LADDER SHOES
• POLE GRIPS • WALL GRIPS • CHISEL GRIPS
LIFELINES & LANYARDS



You
Can't
Fall
It is
a
Life

Saver

IT LOCKS — IT HOLDS

SAFETY DEVICE FOR LADDERS

Prevents Injuries by Falling

EASY TO INSTALL

Fastens Quickly to Present Ladder

SIMPLE TO OPERATE

Men Can Climb—No Instruction

SAFETY SPECIFICATIONS

High Safety Factor—
Will Not Rust or Corrode

Write for Folder

Safety Tower Ladder Co.

P.O. BOX 1052 BURBANK, CAL.

Multiple Tenant Buildings

Industrial concerns sharing buildings with other tenants are subject to many restrictions which do not confront companies having sole occupancy. The company must consider fellow tenants and the building management as well as its own personnel.

These buildings, whose tenants are usually engaged in mercantile and light manufacturing operations, are often located in built-up sections where zoning regulations may restrict some types of operation. Traffic and parking problems are also troublesome.

The following factors should be considered by prospective tenants:

1. Zoning ordinances and their effect on the type of industry.

2. Approval of buildings and facilities by local and state authorities.

3. Floor load capacity.

4. Ventilation and exhaust—particularly of substances that may affect neighboring industries or create a public nuisance.

5. Public transportation and parking facilities.

6. Plant protection—proximity to hazardous operations, type of building construction, fire alarm and emergency lighting equipment, fire-fighting apparatus, watchman service, exits, etc.

7. Electric wiring—adequacy and

Ankle Action Suction Grip, Always Flat

MAKES

Johnson Crutch Tips the Choice of Thousands

You can buy them in most orthopedic hospitals and drug stores or order direct.

65¢ a pair, postpaid

A DANDY CANE TIP.

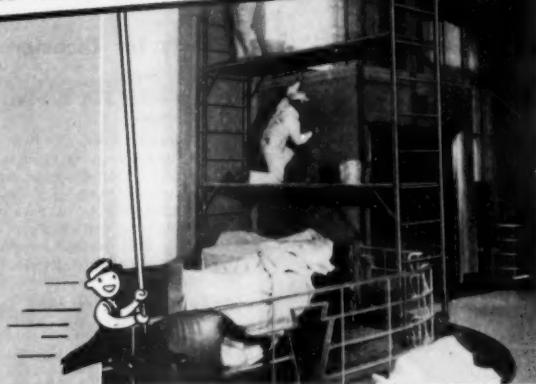
Manufactured of high grade flexible rubber on the same principle as our popular ladder shoes which are used in all industries and a common sight on ladders of workmen in every city and town.

Safely yours,



JOHNSON LADDER SHOE CO. EAU CLAIRE, WIS.

FASTER and SAFER
HANDLING of WALL
and CEILING AREAS...



WITH BAKER SCAFFOLDS

● The Baker Scaffold, with its fully adjustable platform, allows the placement of men at different levels, so that wall areas may be covered faster. The large working platform (13.8 sq. ft.) is adjustable for every 3 inches of height, even when units are stacked to reach high ceilings.

Self-locking trusses give added security and speed in assembly. There are no bolts, nuts or other loose parts to be lost. The absence of "X-Braces" permit the use of Baker Scaffolds in occupied areas... they readily span furniture, machinery, stockpiles and equipment.

Write today for Bulletin 524

Distributors in principal cities. • Listed under
Reexamination Service, Underwriters' Laboratories, Inc.



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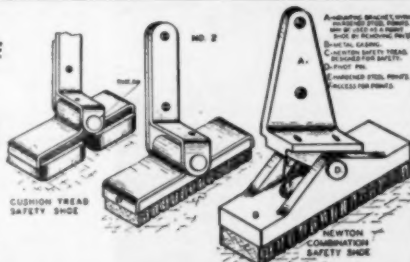
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INDIANAPOLIS 6, INDIANA

**BETTER THAN
INSURANCE**

**NEWTON
LADDER SHOES
PREVENT
THE ACCIDENT**

**ORDER
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OR DIRECT**

NEWTON ENGINEERING SERVICE



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ALUMINUM
LOUISVILLE
LADDERS

EXTENSIONS

Two Sections
thru 48 feet

Three Sections
thru 70 feet

LOUISVILLE
Safe-Weight
ALUMINUM PRODUCTS

HEAVY DUTY STEPS

2 feet
thru 20 feet

LOUISVILLE
Safe-Weight
ALUMINUM PRODUCTS

ROLLING PLATFORMS

Sizes thru 24 feet
in length and
20 feet high

Details of Scaffolding used in Rolling Platform... also available separately in lengths thru 28 feet.

"SAFE-WEIGHT" denotes the Louisville method for securing rungs to side rail... the ultimate in dependability and service. All standard ladders included in line. Send for catalog.

AVAILABLE AT BETTER DEALERS

LOUISVILLE LADDER COMPANY
1101 W. Oak Street—Louisville 10, Ky.

safety for light and power requirements.

8. Elevators—location and provision for operation and maintenance.

9. Personal service facilities.

10. Possibilities for expansion.

Ready for Disaster

—From page 7

4. First-Aid and Casualty Holding Stations

Through Area Medical Director determine adequacy of sites and supplies for major disaster on basis of maximum workers per shift, size of plant, distribution of personnel, type of operations, etc. Suggested lists of supplies and equipment for rescue and first-aid teams are available.

Suggested First Aid Supplies

FIRST-AID CREW

For each member kit:

- Individual 1" compresses
- Sterile gauze squares
- Assorted sterile bandages
- Triangular bandages
- Sterile gauze, 1 sq. yard
- Roll of 1½-inch adhesive
- Burn ointment
- Aromatic spirits of ammonia
- Inelastic tourniquet
- Scissors
- 3-inch splinter forceps
- Paper cups
- 1" and 2" roller bandages
- Wire or board splints
- Castor oil or mineral oil (for eyes)
- Water canteen
- Trench knife
- Steel helmet
- Flashlight, spare bulb, batteries
- Whistle
- Lipstick to mark casualties
- Antiseptic, sedatives authorized by physician

For each team:

- 2 stretchers
- 6 water-repellent blankets
- Traction splints
- 8 60-ft ½" manila ropes
- Replacement for individual kits
- Other equipment suggested by physician

RESCUE CREW

For each member, a personal kit containing:

- Simple first-aid packet—
Triangular bandages
Sterile gauze squares (3" x 3")
Scissors, tourniquet
- Lineman's gloves, pliers, "climbers"
- 60' of ½-inch manila rope
- Pinch bar
- Utility hatchet
- Approved gas mask
- Steel helmet
- Flashlight, extra bulb, batteries
- 100-yard spool of fishline
- Roll of insulating tape
- Safety goggles
- Whistle
- Chalk

For each team:

- Utility truck
- Assorted ropes
- Chain
- Inhalator (plank, horse or EVE resuscitation)
- Block and tackle
- Jacks
- Portable crane
- Ladders
- Acetylene torches
- Picks, shovels, sledge hammers, axes
- Tarpaulins
- Crowbars
- Wrecking bars, carpenter's saws, hacksaws, wedges, chisels, power drills, searchlight

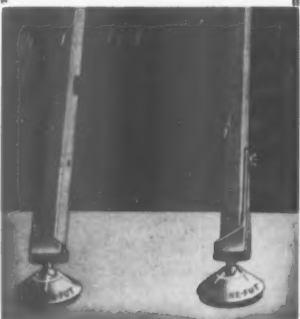
KEEP YOUR LADDERS ON THE LEVEL!



JOHNNY-FOOT stabilizers keep your ladders "on the level" and avoid hazardous blocking. Constructed of high-grade steel, and precision-machined.

JOHNNY-FOOT stabilizers meet Federal specifications. Tested and listed by Underwriters' Labs, Inc. \$13.85 per pair. F.O.B. Factory, freight allowed.

KEEP YOUR LADDERS FROM SLIPPING!



JOHNNY-FOOT safety shoe treads are easily interchanged with a spiked foot when working on slippery surfaces.

JOHNNY-FOOT safety shoe's ball and socket mechanism enables the shoe to fit the contour of the surface, thus ensuring maximum grip. \$6.85 per pair. F.O.B. Factory, freight allowed.

Dealer Inquiries Invited

Write for information on JOHNNY-FOOT stabilizers and safety shoes.

Jon-Ne-Fut Mfg. Co., Inc.

4982 E. Firestone Blvd., South Oats, Calif.

SECTION 3

Industrial Health Engineering

Ventilation

VENTILATION has been defined as the process of supplying air to or removing it from any space. This may be accomplished by either natural or artificial means.

Basically this involves provision for general air requirements for the health and well being of occupants. Where processes are not injurious to health general ventilation is satisfactory. It is also satisfactory where dilution of the air contaminant will keep the concentration below permissible limits for continuous exposure.

Where toxic materials are handled, removal of air contaminants at their source is necessary.

Air conditioning means control of physical and chemical properties of air. It includes control of temperature and humidity as well as air motion and removal of impurities.

Heating and humidifying the workroom air in winter and cooling and dehumidifying it in summer are involved. In the public mind it is associated with summer comfort air conditioning as provided in theaters, restaurants and stores, and in an increasing number of offices.

Air conditioning is also important where the product requires uniform temperature and humidity and freedom from dust. The needs of the product are not necessarily those best suited to personal comfort.

With air conditioning and modern lighting the plant is independent of

climate. The building may be windowless or fixed sash windows may be used for psychological reasons.

General Ventilation

Ventilation is often made more expensive and complicated by the necessity of maintaining a comfortable temperature in the room. Exhausting impure air is usually practicable but in cold weather it may be difficult to warm large volumes of incoming air.

Natural ventilation is adequate for some buildings housing non-hazardous operations. Air circulation is aided by doors, windows, roof ventilators and monitors. The number of outlets should be planned for hot weather when the temperature difference inducing the draft is at the lowest point.

Air intakes should be located so that incoming air is properly tempered and does not cause uncomfortable drafts in cold weather.

Artificial general ventilation requires properly located inlets and outlets. Air coming into the room must be uncontaminated and discharge points should be located to avoid recirculation.

When the contaminant is heavier than air, openings at floor level permit its escape.

Fans and blowers. Both portable and stationary types are useful for increasing circulation of air which affords relief from heat. They are not substitutes for exhaust ventilation where toxic materials are handled.

Devices for maintaining air circulation become less effective as temperature and humidity rise.

Dust and Gas Problems

Dust problems are usually more difficult than control of gases, vapors,

mists and fumes. Dusty operations tend to project particles so that the hood must provide velocities sufficient to draw them into the exhaust system.

Dust control hoods should be enclosed as much as possible or the hood should be located to take advantage of the directional effects of the dust flow.

Dust removal systems generally require higher air velocities and ducts of heavier gauge metal than those designed for gases.

Control Measures

Where there is a definite source of air contamination, general ventilation alone is seldom sufficient. Control measures involve three steps:

1. Identifying the substance and locating its source.
2. Atmospheric sampling to determine nature and extent of contamination.
3. Engineering control measures. Control at the source may involve one or more of these measures:
 1. Isolation or enclosure of the hazardous operation.
 2. Local exhaust ventilation.
 3. Operational changes involving substitution of process or materials.

Isolation confines the operation to a definite location. Exposure of workers is either eliminated or restricted to a few selected, trained and equipped operators.

Examples of combining exhaust ventilation with isolation and en-



A cyclone dust collector installed at a woodworking plant.



A bag type dust collector which prevents objectionable dusts being discharged into the atmosphere. (Pangborn Corp.)

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Welding fumes and smoke are removed at the source and collected by electrostatic precipitation. For this exposure recirculation of cleaned air is permissible. (American Air Filter Co.)

sure are: sandblasting rooms, shake-out and tumbling-barrel operations in foundries, dry mixing, and mixing of volatile liquids.

Processes creating excessive heat, humidity or noise should also be isolated wherever possible.

Local Exhaust Systems

Local exhaust systems are an important means of occupational disease control. Their purpose is to create a sufficient movement of air to withdraw the contaminants at their point of origin and convey them to a safe point for disposal.

An exhaust system consists of four major parts:

1. Hoods or enclosures near source of contaminant.
2. Piping to connect hoods into system.
3. Collection equipment.
4. Fan.

Each part has its independent function but all must be designed to work together efficiently.

The exhaust hood is the most important part of the system. It should enclose the process as completely as possible. Air velocity decreases approximately with the square of the distance from the hood opening.

Air velocity for effective control varies with the process and material exhausted. Generally speaking, the better the enclosure and design of



Exhaust hood carries away fumes from light soldering operation. (Westinghouse)

the hood, the less need for high velocities.

Hoods or enclosures may be in the form of booths, canopies, lateral hoods, downdrafts through grill openings below the process, or slot-type hoods. The object in each instance is to remove the contaminant without drawing it through the breathing zone of the operators and with minimum interference with processing.

Efficiency of hoods can be increased by addition of flanges.

Ducts connect the hoods to the central fan, distribute the air flow in direct proportion to the requirements of each inlet, and maintain adequate pipe velocity to convey the contaminant to the point of discharge.

The system should be balanced so that each hood draws the proper amount of air. When this condition has been obtained, all means of adjustment should be permanently fixed. The areas of branch pipes and main ducts can be calculated to give the correct air velocities throughout the system.

Material used for ducts must resist abrasive action of dust or corrosive effect of gases and vapors.

Sharp turns in ducts should be avoided. They take extra power and cause a large pressure drop.

Traps with clean-out gates should be provided at the bottom of vertical runs, and clean-out gates at regular intervals on the bottom side of horizontal runs.

Fans should have a capacity slightly higher than calculated requirements to allow for leakage in the system, accumulation of material on fan blades and similar difficulties.

Where the contaminant is hot and has a natural tendency to rise and the operation can be provided with an effective enclosure type hood, natural draft ventilation is often satisfactory.

Disposal of Contaminants

Equally as important as collecting the air contaminant is its proper disposal. Gases, vapors and mists may often be discharged to the outside atmosphere at a point where they will not recirculate around the premises in harmful concentrations.

Dusts, both harmful and nuisance, require the use of dust collectors in the system.

Recirculation of air from exhaust systems is not generally desirable, particularly when the air has contained gas or fumes. Where only nuisance dusts are involved recirculation after cleaning is often permissible. This practice is not desirable where dusts containing lead, silica, asbestos, and others, are handled. Air coming from the cleaning device must fall within the permissible range for harmful or flammable dusts.

Dust Collectors

Methods of removing dust from the air exhausted by the system include:

1. Filtration
2. Electrical precipitation
3. Wet collectors
4. Dynamic precipitation
5. Supersonic flocculation

Filters are the oldest and simplest way of removing dust. They consist of porous mediums through which dust-laden air is drawn. Some filters are designed to collect dust in the form of a layer on the upstream surface. This is characteristic of cloth and paper filters. The thicker types, such as those constructed of metal mesh treated with oil, have a greater dust-holding capacity.

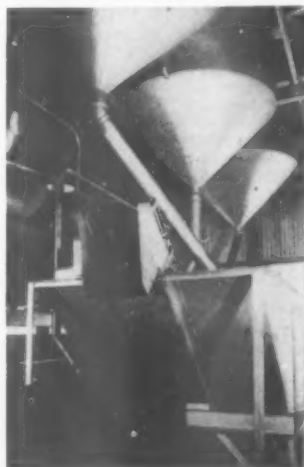
A practical filter should have these characteristics: (1) low initial resistance to air flow; (2) reasonable length of service; (3) efficiency under changes of temperature and humidity; (4) low flammability; (5) low replacement cost or ease of cleaning; (6) low maintenance cost; (7) freedom from odors.

Electrostatic precipitation. This method is highly efficient, particularly for fine dusts which are difficult to remove by other methods. It offers low resistance to air flow.

Electrostatic precipitators are not efficient in collecting large particles moving with considerable force, nor for high concentrations of dust. They are valuable when the manufacturing process requires a practically dust-free atmosphere.

Cyclones. A cyclone consists of an outer cylinder fitted with an inverted cone-shaped hopper and an inner concentric cylinder which serves as

—To page 71



Dust-collector of the wet cyclone type. Note water pipe at upper left. (Allis-Chalmers Manufacturing Co.)

Washrooms and Lockers



Wash fountains and lockers in employee service building of Sohio Oil Company's Latonia, Ky., refinery. Special under-floor ventilating system with fresh air inlets in concrete bases and mechanical roof ventilators keep locker rooms fresh. Individual lockers have two compartments so that employee can use one side for street clothes and the other for work clothes. Glazed tile walls and concrete floors simplify maintenance. (The Austin Co.)

FACILITIES for personal cleanliness, comfort and convenience are conspicuous factors in good working conditions. Adequate and well-maintained washrooms, toilets and lockers encourage better attitudes and attract desirable workers.

Attention to these requirements in planning industrial and commercial buildings will insure sufficient space and convenient location. Otherwise they may have to be fitted later into less suitable space.

Many plants have outgrown their original facilities. A survey of present equipment checked against the number of employees will show whether additions are needed. Also, equipment should be examined critically according to modern hygienic and decorative standards.

Assistance in planning new quarters or modernizing existing equipment is offered by many manufacturers of washroom equipment and supplies.

Clean washrooms and locker rooms can be maintained only by constant attention. Higher standards of sanitation and lower maintenance costs can be achieved at little extra cost when buildings are planned. Dirt catching cracks and corners and dust collecting surfaces can be avoided. Floors and walls of easily cleanable material can be specified.

Location. Depending on the size and type of plant and its operations, lockers, lavatories and toilets may be in one central location or scattered throughout the plant.

In smaller plants, washrooms and lockers are usually near the entrance.

Toilets should be not more than 200 feet away from any work place.

In multi-story buildings, one on each floor is desirable. If that is not practicable, they should not be more than one floor above or below the work place.

Washrooms in large one-story buildings usually are scattered throughout the building. Where there are many small isolated buildings, as in chemical plants and railroad yards, or where much of the activity is outdoors, a separate building may house all these facilities.

Accommodations should be located so that employees will not have to cross highways or railroad tracks to reach them.

When lockers and washrooms of a large plant are near the main entrance, small rooms with lavatories and toilets are often scattered through the plant. This saves the worker's time and makes it possible to close the main room during working hours, lessening danger of theft and requiring less supervision.

Separate washrooms and lockers are desirable for departments where there is exposure to excessive dust, dirt, heat, vapors, or moisture. These need more lavatories or shower baths than cleaner departments.

Offsetting the advantages of scattered facilities, is the higher cost of installation and maintenance. Centralized toilet and washing facilities are often preferable where women are employed. In some plants a full-time attendant may be needed.

In some large plants with underground passageways connecting buildings and departments, personal service facilities are often located along them, conserving space for manufacturing operations. Another space-saving method is to locate them on balconies.

Light. Fixtures should provide sufficient light in all parts of the room. Walls, ceilings and partitions should be light in color to conserve light and encourage cleanliness.

Ventilation. Unless the washroom has sufficient outside windows for natural ventilation, forced ventilation will be needed.

Floors, and walls to a height of at least six inches, should be of impervious material, such as glazed tile or concrete. Walls should form a tight joint at the floor level, or there should be a cove base at least six inches high.

Wash Fixtures

Group washing equipment. In industrial plants, institutions, schools and other establishments where facilities must be provided for large groups, circular wash fountains are the most frequent choice.

Eight to 10 users can be accommodated at a 54-inch circular fountain and 5 to 6 at a 36-inch unit. Fewer valves and plumbing connections mean additional economies in installation and maintenance.

Economy of water is another advantage. Several persons washing at a circular fountain use little more water than one at an individual basin. Each user washes in clean running water of regulated temperature. A foot or hand-controlled mechanism regulates the flow.

Semi-circular units 36 or 54 inches wide mounted against a wall are used for narrow or irregular washrooms.

Precast stone and marble are the most frequently used materials. Some models are also available in enameled iron and stainless steel.

Individual basins of vitreous china or enameled iron make an attractive installation where comparatively small groups are to be accommodated.

Mixing faucets, rather than separate faucets for hot and cold water are recommended. Hot and cold handles should be plainly marked, with the hot water valve always on the left side. Thermostatic control of water temperature is a desirable safeguard.

Stoppers should not be used. Faucets should permit washing in running water.

Where first cost must be considered, enameled troughs may be used. Over these are hot and cold water pipes with mixing faucets spaced not less than 24 inches apart. Double-width troughs, or single-width troughs back to back, save space.

Spray heads at basins or troughs encourage a thorough job of washing. They should be high enough above the trough to permit washing head, arms and shoulders under the spray.

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Drinking Water

HEALTH and efficiency, as well as physical comfort, require an adequate supply of pure drinking water. It can be provided at a moderate cost in any industrial plant.

Drinking facilities should be conveniently located and inviting in appearance. Workers will not drink enough water unless it is clean, cool and palatable. The attractiveness of the dispensing fixtures is also important—particularly for women employees.

In providing for the needs of workers, the following should be considered:

1. Number of persons to be served.
2. Type of work—light or physically strenuous.
3. Temperature of workroom.
4. Purity of water.
5. Temperature of water.
6. Design of fixtures.
7. Location of outlets.

One outlet for each 50 employees has been suggested as a minimum. More will be needed if the temperature is high or the work involves physical exertion.

If outlets are too far apart workers will not drink enough water or they will spend too much time away from work. It should not be necessary to walk more than 50 feet for a drink.

Water supply. Pure water is an important responsibility of every city, and health departments maintain a close watch over the water supply. But when the plant is located outside the city limits, and for temporary operations such as construction, public utility and oil-

field work, the employer must supervise the water supply. It should be analyzed regularly.

If unapproved or "service" water is used for industrial processes or for fire protection, signs should be posted warning against its use for drinking. Care must be taken to avoid possibility of cross connections between the two systems.

Sterilization. Water of questionable purity can be made safe for drinking by chlorination or boiling. Compounds for sterilizing water, some in convenient tablet form, are available.

Filtration is desirable for removal of sediment but this will not kill harmful bacteria.

Temperature of water. For workers who perform heavy manual labor, from 50 to 55 degrees F. is recommended. For office workers, restaurant patrons and others who are less active, the temperature may be as low as 45 degrees.

Methods of Dispensing

Two approved methods of dispensing drinking water are: (1) Drinking fountains of approved design; (2) Paper cups provided at the outlet.

Drinking fountains with individual cooling units are more suitable for many types of industry than a central cooling system. Fountains should conform to specifications of the ASA Code. Important features are a diagonal jet, which does not permit water to fall back on the nozzle, and a guard to keep the user's lips away from it. If ice is used for cooling it should be in a separate compartment without direct contact with the water.

Some older installations in factories, offices, stores and public buildings which do not conform to hygienic standards can often be modernized at reasonable cost.

Desirable accessories in drinking fountains are line strainers and pressure regulators. An outlet for filling glasses is also useful, particularly for office use.

Hazardous locations. For use where flammable gases, vapors and dusts may be found, explosion-proof fountains are available.

Paper cups should be kept in dust-proof containers and receptacles provided for used cups. The container must be kept filled or workers will salvage old cups.

Sanitation. A cuspidor or sand urn at the fountain will prevent much discarded chewing gum, tobacco, etc., being deposited in the fountain bowl.

Maintenance of drinking fountains must be watched to prevent unsightly and unsanitary conditions. A few employees will need reminding of the importance of habits of cleanliness and education is easier when accompanied by a good housekeeping program.

Portable containers. For many jobs remote from the city water mains, as in construction work, public utility and railroad maintenance, in mines and other isolated working places, an open water bucket too often is the means of supplying drinking water, with one cup or dipper serving the entire crew.

Portable coolers, with dispensers for paper cups, are particularly useful on temporary jobs where employees must work at a distance from a source of pure water. The container should have a tight-fitting cover.

Portable drinking fountains provide another method. One model uses a hand pump to maintain pressure. Slight pressure on a valve releases a jet of water at an angle, as in approved permanent installations, and a guard prevents lips from coming in contact with the nozzle. Insulation keeps water cool for several hours.

Salt tablets in individual packages should be available in hot weather.

SALT IN DRINKING WATER

SALT is very necessary to health. Salt and water will keep you alive longer than water and food with the salt removed.

Your body consists of about 80 percent water. Salt is important in helping to keep the necessary amount of water in all parts of your body.

But both the water and salt in your body gradually are being used up. One of the chief causes of these losses is heat which causes perspiration. A man working in summer sun or in the heat of boiler rooms, foundries, blast furnaces, bakeries, etc., may lose as much as two gallons of water through excessive perspiration in eight hours. Salt also is lost in all perspiration.

It is very necessary to replenish this salt and water lost from your body. Lack of salt is often a cause of heat cramps.

You can easily keep the salt content of your body normal by adding salt to your drinking water. Add a level teaspoonful of table salt to one gallon of water (or smaller quantities in the same proportion). Cool, not ice-cold, water is best for drinking.

Many companies provide salt for employees in tablet form, in convenient containers at the drinking fountains. Salt also should be used freely in summer foods and drinks.



SAFETY INSTRUCTION CARD

No. 413

Hot Weather Hygiene

MAINTAINING HEALTH, comfort and efficiency in hot weather requires close attention to working conditions by the employer and observance of reasonable precautions by the worker.

Good ventilation of the workplace and adequate washroom facilities and drinking water are essential in reducing discomfort. Canteens and lunchrooms also help to relieve fatigue.

Acute Ailments

Exposure to extreme heat, especially when accompanied by physical exertion, may result in heat cramps, heat exhaustion, or heatstroke. Knowledge of correct first aid treatment for each type of ailment is important. All cases should receive medical attention.

Heat cramps are due to excessive loss of salt and moisture from the body. They come suddenly and may involve skeletal or intestinal muscles. Even if the moisture of the body is replaced by drinking plenty of water, loss of salt may cause heat cramps.

Heat cramps are relieved in a few hours by proper treatment but soreness may persist for several days.

Heat exhaustion is a shock-like state also resulting from loss of salt and moisture. Symptoms are pallor, relatively low temperature, weak pulse, a feeling of restlessness or anxiety, and sometimes unconsciousness. It is a much more severe condition than heat cramps and is occasionally fatal. A person with either

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- Efficiency

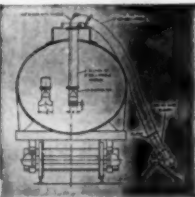
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Vano Design "A" cooling interior of furnace, supplying fresh air through 10 feet of "Ventube" to provide safety and comfort during repair work.

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Vano Design "A" Ventilator plus a few accessories feeds large air volume into tank car, driving out fumes, stagnant or hot air for workers' safety and comfort.



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Vano Design "C" equipped with 8" discharge tubing removing welding fumes.

Vano Design "C" equipped with two suction lines removing welding fumes for operators' safety.



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condition should be given salted water, if conscious, and put under medical care as quickly as possible.

Heatstroke (also known as sunstroke) is caused by exposure to an environment in which the body is unable to cool itself sufficiently. It is not necessarily the result of exposure to the sun. As a result, body temperature rises, and the heat-regulating mechanism breaks down.

Symptoms are severe headache, flushed face and high temperature, visual disturbances and loss of consciousness. Death may occur within a few hours, but if timely treatment is available the patient has a good chance of recovery. One of the after-effects is inability to withstand heat.

In general, the same precautions will help to prevent or minimize all types of disability due to heat.

Serious exposures include boiler and engine rooms, foundries, steel mills and glass plants. Seasonal heat hazards are found in construction work, public utility, highway and railroad maintenance, and farming.

Sunburn can be painful and dangerous. In strong sunlight, the head should be covered and exposure of the skin kept at a minimum. Treatment is the same as for any other type of burn.

Use of Salt

Maintaining the salt in the body at an adequate level enables men to work at strenuous occupations in high temperatures. For sedentary workers, normal use of salt with food may be sufficient, but those whose jobs require greater physical exertion may not take enough by this method.

Dispensing. The most convenient and popular method for providing salt is in tablet form. The 10-grain size is more frequently used, and it may be obtained either as pure salt or in a combination of 70 per cent salt and 30 per cent dextrose. Tablets containing dextrose are more palatable and more easily assimilated.

For those who find difficulty in taking even a moderate amount of salt, enteric-coated tablets are available. These pass through the stomach intact and dissolve in the intestines.

In most plants, a dispenser for salt tablets will be found beside the drinking fountain. Dispensers are made in several styles and sizes.

The drink of water is as important as the salt. A full glass of water (eight ounces) should be taken with each tablet.

Another method is to add salt to the water. This is practicable where the drinking water is not used in the



**Group of RUEMELIN Fume Collectors
Keeps Shop Clear of Welding Fumes**

This well ventilated welding department is typical of hundreds of similar installations. Welding operators appreciate smoke and gas-free atmosphere. Thousands in service. Many repeat orders. Collecting fumes at the source with local exhaust hoods has proven most practical in operation. It is particularly helpful in winter months when doors and windows are closed. Write for Bulletin 37-D describing all types of Ruemelin Fume Collectors.

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Industrial processes. Concentrations of from .1 to .5 per cent, depending upon the temperatures and nature of the work, are used in some plants.

Use of salted drinking water should be under medical supervision.

Caution. Persons with kidney or heart disease or high blood pressure should seek medical advice on the use of salt. However, such men should not be placed on jobs where they would be exposed to high temperatures or heavy manual work.

Washrooms and Lockers

—From page 53

Showers are needed in many industries, particularly where operations are hot or dirty, or where toxic materials are used. Requirements depend upon health hazards of the plant. They range from one shower for every five men to one for every 15 men.

Showers may be of the compartment or the circular multi-stall type.

Floors and approaches should be of non-slip material, such as concrete with an abrasive surface. A curb 4 inches high should be erected around the shower stalls to keep water within the enclosure.

The curb should be painted a contrasting color to prevent tripping.

Fungus infections. The warm moist air of shower rooms offers an ideal place for the propagation of fungi which cause "athlete's foot." Floors and shower stalls should be scrubbed daily as a general sanitation measure. Disinfection by germicides is helpful, although the importance of the floor in transmitting infection from person to person has been questioned.

Preparations for toughening the skin, antiseptic foot powders, and careful drying of the feet are among the preventives used. Pans of antiseptic solution at the entrance of shower stalls are now regarded as useless for killing organisms.

Emergency showers. Quick-acting showers should be installed at convenient locations where caustics, acids and other corrosives are handled.

Skin Cleansers

Skin cleansers may be classified as soaps, sulfonated oils, and synthetic detergents.

Powdered soaps are more economical than hard soap in individual cakes. These consist principally of powdered hard soap, a scrubbing agent and a water softener. The corn meal scrubber may be coarse or fine. Most of these soaps can be used with hard water.

Liquid soaps are generally satisfactory where a scrubber is not desired. They are frequently used in

—To page 58

Protect your employees' health
As collection efficiency goes up
employees' hazards and main-
tenance costs go down with the

AEROTEC INTEGRAL DUST COLLECTOR

(Above) Exhaust from this Aerotec Integral, connected to automatic precision grinding machine, is returned clean to the room. Conveying velocity is 4500 fpm. This is one of many Aerotec applications at the Winchester Repeating Arms Company, Division of Olin Industries, Inc., in Connecticut.

(Right) Note the compact arrangement of elements in the Aerotec Integral Collector. As this cutaway view shows, the large cyclone for collecting larger dusts, has an outlet leading to a series of highly efficient, small diameter tubes, for the finer dusts.

- Self-cleaning tube design — No filters to plug
- Trouble-free operation — No moving parts to fail

Combatting the hazards of industrial dust with the Aerotec Integral Collector is good insurance against loss of productivity in your plant. You safeguard the health of your workers and eliminate the danger of explosion from high dust concentrations. In addition, you protect machinery and equipment in your plant from excessive wear or corrosion caused by abrasive or corrosive dusts. Efficiency goes up; maintenance costs down.

The Aerotec Integral Collector controls dangerous dusts at their source with a higher constant collecting efficiency than conventional impingement types, over a wide range of flow rates. There are no filters to plug or liquids to watch. This unit delivers constant suction at the hood. It operates for long, maintenance-free periods, requiring only periodic emptying of the spacious dust bin.

To meet increasing government demands for high production schedules, plant engineers in heavy industrial sections of the nation are ordering more and more Aerotec Integral Collectors. It is an ideal way to assure clean, healthful surroundings that pay off in high output and worker satisfaction. To determine just the right type of equipment for your particular dust collection problem, call or write today.

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THE AEROTEC CORPORATION
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Washrooms and Lockers

—From page 57

office washrooms and first-aid rooms.

The soap should contain no free alkali and should show a low pH in dilute solution. This can be determined before purchasing.

Sulfonated oils are useful for dry and soap-sensitive skins and for those exposed to the defatting action of petroleum oils and solvents.

Synthetic detergents of several types are useful for removing oil, wax and tar.

A cleanser can be efficient in removing soil yet gentle to the skin.

It is sometimes necessary to use different cleansers in different parts of the plant, or to use different cleansers to remove the same kind of soil.

Use of naphtha, turpentine, carbon tetrachloride and other solvents should be discouraged. Some are toxic, some are highly flammable, and all have a drastic defatting action on the skin.

Drying the Skin

Paper towels meet sanitary requirements and are economical and convenient. Dispensers should be kept filled and receptacles for used towels provided.

Recessed waste receptacles take one more object off the floor, improving the appearance of the washroom and making cleaning easier.

Mechanical hot air driers are acceptable from the hygienic standpoint. They are foot operated and may be of the pedestal type or recessed into the wall. Equipment must be well grounded and the electrical connection permanently installed without extension cords or plugs.

Towel services are used by some establishments, usually stores and offices. For industrial use, individual towels kept in lockers may not be changed often enough and they may come in contact with soiled work clothes.

The common towel is now quite generally banned but it lingers, often illegally, in some shops.

Toilets

Toilets should be partitioned off from washrooms and lockers. Partitions of enameled metal are attractive in appearance and easy to keep clean. These partitions may be suspended from the ceiling or mounted on the walls.

Wall-mounted toilets make floor cleaning easier and quicker. The long, oval-rim type of toilet with open-front plastic seat is most widely used. Foot-operated flush valves are favored by many.

The flushing mechanism should be rugged since employees often kick the handle instead of operating it by hand. Flush valves should be equipped with vacuum breakers to avoid back siphonage.

Minimum number of toilets:

No. of persons	No. of toilets
1- 9	1
10- 24	2
25- 49	3
50-100	5
Over 100	1 for each additional 30 persons

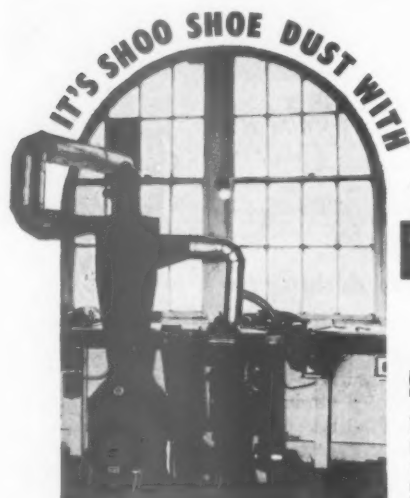
Toilets should be not more than 200 feet from any work place; preferably less than 150 feet.

Facilities for men and women should be plainly marked.

Urinals should be placed throughout the plant in convenient locations to avoid loss of time. One urinal for each 40 men is usually sufficient. Automatic flush valves use more water but are more effective in maintaining cleanliness since many persons seem reluctant to touch hand-operated valves.

Floors of toilet rooms should be of impervious materials, smooth and free from cracks. Tile and concrete are satisfactory. Floor drains permit frequent flushing.

If possible, toilet rooms should have outside windows for light and ventilation. State or municipal regulations usually contain provisions for ventilation.



THIS

TORIT

DUST SEPARATOR

Here is an installation involving a heavy volume of dust and lint, some of it of a particularly adhesive character.

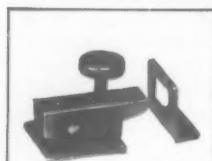
It was solved to the complete satisfaction of the user and the Wisconsin Industrial Commission, with the Torit 19-FM Dust Separator illustrated.

Torit dust collecting equipment connected to individual or small groups of machines possesses many advantages. There is little or no idle running time. No maze of piping obscures lighting arrangements, and pipe line friction is practically eliminated. Neither is there any interference with production set ups.

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TORIT DUST COLLECTORS
Now in Operation**

Switches for lights, electrically operated driers or other equipment should be located so they cannot be operated by a person in contact with piping or other grounded conductor. In pull-chain fixtures the chain should be interrupted by an insulating link close to the fixture.

In plants where eating rooms are close to toilet rooms, covered receptacles for disposal of waste food should be provided in the lunch-rooms. Eating lunches in the toilet room should not be permitted.

Cuspidors should be provided where needed and cleaned at least daily. The disposable type requires less handling.

Lockers

A well-equipped locker room is a necessity in any plant. It is an aid to orderly habits and often to health.

Exposure to toxic substances calls for extra precautions to prevent dangerous materials being carried away on clothing. Separate lockers prevent contact between street and work clothes. They should preferably be in separate rooms with shower stalls between them.

In such plants supervised washup periods and shower baths are important safeguards.

Sloping tops prevent their use for storage, a practice which sometimes demands constant supervision. Dust is conspicuous and easier to remove than with flat-topped lockers.

Built-in lockers extending to the ceiling avoid dust-catching surfaces.

Lockers should be at least four inches off the floor to permit flushing the floor without wetting the contents of the lockers.

Forced ventilation supplied through perforations in the bottom of the lockers or through louvers in the doors is helpful in removing odors. If the work is heavy or wet, circulation or heated air through the lockers is desirable.

Baskets and hangers on elevating chains are used instead of lockers in some industries, such as mines and foundries. Damp work clothing can be dried out between shifts and the drying is often hastened by steam coils at the ceiling. Such an arrangement conserves floor space.

Rest Rooms

A rest room should be provided in all establishments where 10 or more women are employed. Where there are fewer women and a separate room is not available, suitable space, properly screened, should be provided.

For 10 women, minimum space is 60 square feet, with at least 2 square feet for each additional woman employee. For less than 100 women at least one bed or couch should be provided; for 100 to 250 workers, 2 beds, and 1 bed for each additional 250 workers.

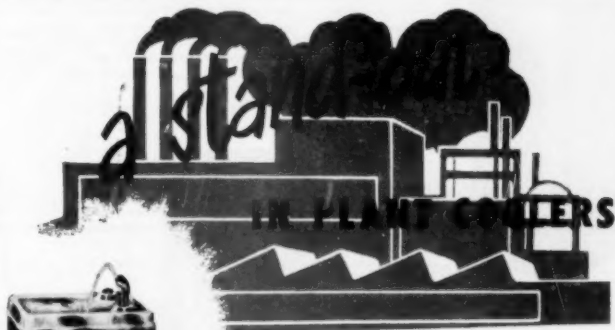
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Don't confuse HANDEEZ with ordinary harsh abrasive-action hand cleaning compounds. HANDEEZ works differently—through a gentle emulsifier blended with a sterilized vegetable emollient. It lifts grime from the pores, leaving skin tissue unharmed and unbroken by tiny crevices which invite infection. Cutting oils and other deep-seated shop grime yield readily to the HANDEEZ formula which spells prompt, efficient cleansing with the added skin-safety factor.

Write for the booklet "Be Kind to These Hands."

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DOLGE
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Here is one of the newest coolers in the Halsey Taylor line—designed for long life and faultless service, with its gleaming stainless steel top and distinctive Halsey Taylor health-safe advantages. It's a stand-out in coolers . . . but just one of the many made by Halsey Taylor for office, or plant use! Write for literature.



F-30

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Coolers

THE HALSEY W. TAYLOR CO. WARREN, OHIO



EXPLOSION-PROOF TEMPRITE WATER COOLERS

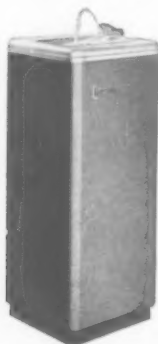
TEMPRITE'S complete line of 10 drinking water coolers now includes an explosion-proof unit which may be installed and operated with complete safety in dangerous, combustible atmospheres. The refrigeration compressor is hermetically sealed and all electrical apparatus and connections are enclosed within Underwriters'-approved, explosion-proof housings. A water cooled condenser is used to obtain the large cooling capacity required for industrial applications and high ambient temperatures.

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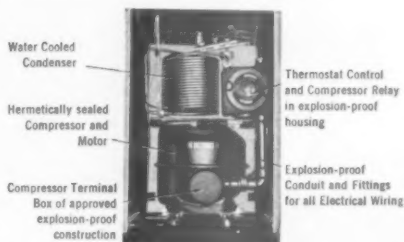
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- Class I, Group C. Atmospheres containing ethyl ether vapor.
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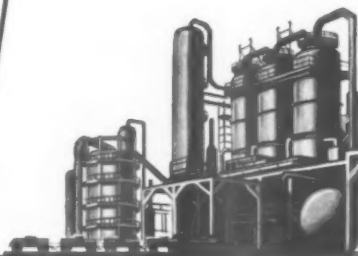


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STEPAN pH6 cuts the toughest grime — gently, swiftly. Recommended for oily operations or where workers are in contact with known skin irritants.

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Fast—but gentle—pH6 takes the hazard and irritation out of wash ups. Raw, red "Factory Hands," the uncomfortable and often inefficient result of scrubbing with harsh cleansers, can be a thing of the past with pH6 in your plant washrooms.

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LUSTRECLEAN (pine-scented or plain) cleans... deodorizes... and deposits a light film of wax. Effective on any type of surface! No heavy scrubbing. No rinsing. Mop dry... buff the film lightly if a soft satiny finish is desired! Save time and labor cleaning floors, walls, woodwork—wherever excessive wear and heavy traffic has made daily maintenance a back-breaking job.

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SAVE \$ \$ \$... WAX as you WASH

I'd like to try a sample of LustreClean

Pine-Scented ☐ Plain ☐

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MAN! That's The Fastest Drying Hand Dryer I've Ever Seen!



Saves Towel & Maintenance Expense, TOO!

NEW Sani-Dri Brings You Basic Improvements Never Before Possible!

Amazingly fast drying time—plus the advantage of cleaner, more sanitary washrooms—make the New Sani-Dri popular wherever it is installed.

Now you can be sure of providing fast, efficient hand drying service... and save continuing towel expense. Saves washroom maintenance costs too! No empty towel cabinets to fill. No unsanitary waste containers to empty or become a fire hazard.

The new Sani-Dri is available in two models—No. 8-SWA Hand dryer for washrooms; and No. 8-SWH Hair Dryer for Shower rooms, pools, etc. Both models are easily mounted to the wall and carry the Underwriter's Seal of Approval. Investigate this new fast-drying Sani-Dri today!

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Skin Infections

SKIN DISEASES are the most common occupational ailments. It has been estimated that they are responsible for as much as 60 per cent of all compensation claims for occupational diseases.

No occupation seems to be exempt, and even many normally harmless substances can irritate some skins.

These are two general types of industrial skin affections: (1) Primary irritant dermatitis; (2) Sensitization dermatitis.

Primary irritation dermatitis. Practically all persons suffer skin irritation from acids, alkalis, irritant gases and vapors, and physical agents, such as heat, cold and friction. Brief contact with a primary irritant in high concentration or prolonged exposure to a lower concentration results in skin inflammation. Allergy is not a factor in these conditions.

Sensitization dermatitis is the result of skin sensitivity to a given substance. This form requires a definite period of sensitization. During this period the offending substance causes no response unless there is contact with concentrations high enough to cause primary irritation. Once sensitization develops,

even small amounts of the material can cause symptoms.

Some substances can produce both primary irritation and sensitization dermatitis. Among them are organic solvents, formaldehyde, and chromic acid.

Cutting oils and compounds are frequently involved in dermatitis where cutting and turning of metals is performed. Skin affections are most commonly caused by blocking of the hair follicles by oil as well as by the defatting action of petroleum products.

Laboratory tests have failed to show significant numbers of pathogenic organisms in cutting oils. If sterilization is considered necessary, heat is the preferred method. Addition of germicides may cause increased skin irritation.

Periodic removal of oil from the machine, filtering to remove foreign materials, and thorough cleaning of the machine before replacing are recommended.

Cutting compounds (oil-water emulsions) should be changed frequently. The old emulsion should be discarded, the machine cleaned thoroughly and refilled with fresh compound.

Other occupational affections include lesions from contact with paraffin, pitch, coal tar, arsenic, and certain oils.

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MANAGEMENT likes the safe, sanitary, efficient, trouble-free Mione features, plus its economy per pound, low cost per scrub-up, and the basic economy of skilled hands always at top productivity.

YOUR SUPPLIER of washroom needs can give you full particulars about Mione so that you, too, can benefit from the know-how gained from 40 years of making nothing but better and better soap for the hands.

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Makers of famous hand soaps
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COLLINGDALE PENNSYLVANIA

How to get your Safety Messages Read

Bulletin Boards are really seen once — when there's something new on them.

Time Clocks are punched four times a day — always in a hurry.

Pay Envelopes reach workers once a week, but their minds are on what's inside.

But the average worker takes a drink of water at least 3 or 4 times a day. He's *relaxed and receptive*, then — ready to see and read the brief message you put on the face of his AJAX Paper Cup.

There's no better way to really register your safety — or other — messages with employees than to imprint them on AJAX Cups. Vary the message from time to time to maintain interest.



He gets a drink of water several times a day
**Put your Safety Message
in his hand on an AJAX CUP**



Your employees will enjoy the crisp, clean AJAX paper cups. They will appreciate your efforts to provide comfortable drinking facilities and combat the hazards of transmitted infections.

Write today for the full story on this Complete Safety Drinking Service Plan — see handy coupon. Bring your workers better health and tell your safety messages at the same time.

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Tell me more about your Safety Message Plan. Send me without obligation the whole story with samples of imprinted AJAX Cups.

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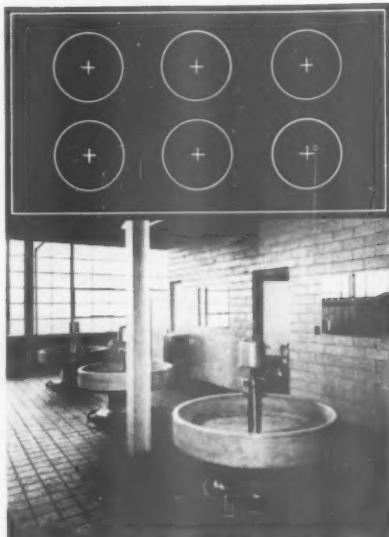
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As important as any Safety measure in your plant are employee washing facilities . . . Bradley men can help you in washroom layouts to provide maximum facilities in minimum space.

They can show you how plants large and small throughout the nation have standardized on Bradley Group Washfountains, and explain how piping connections are reduced over 70 per cent along with water consumption and maintenance.

If, before calling in a Bradley man, you want further information, write for a copy of our 4-color Catalog 4701. There is no obligation. **BRADLEY WASHFOUNTAIN CO.**, 2237 W. Michigan Street, Milwaukee 1, Wisconsin.

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Medical supervision. Workers exposed to agents which produce these conditions should be examined frequently. Personal cleanliness should be encouraged by the provision of adequate sanitary facilities and by supervision and education.

Workers who suffer recurring attacks should be transferred to jobs where they will not be exposed to the offending substance.

Prevention

Primary irritation dermatitis depends essentially on exposure to relatively high concentrations of the irritant or for fairly long periods.

Mechanical methods of operation have been most successful in preventing these exposures. In some cases exhaust ventilation has been helpful.

Where mechanical methods are not practical, personal protective equipment is needed. Aprons, sleeves, gloves, and for severe exposures even complete suits of impervious materials are available.

Protective creams prepared for different types of irritants are also helpful in minimizing skin contact. These must be used regularly and applied several times during a shift.

Personal cleanliness is essential in preventing both types of dermatitis. Frequent washing with a safe skin cleanser and warm water reduces the time irritant is in contact with the skin.

In sensitization dermatitis, prevention of the original exposure is essential. This is the cause of the allergic state. Once this state is reached, even small quantities of the substance will cause trouble. Extreme care should therefore be used in handling potential sensitizers.

CUTTING OILS and COMPOUNDS (Skin Troubles)

Operators who work with cutting oils and compounds may be troubled with rash, pimples, or boils, if they permit the skin to become plugged with dirt and oil.



1. Before beginning work, both in the morning and after lunch, wash hands and arms with soap and warm water.
2. When quitting work, both at noon and night, scrub hands and arms thoroughly with soap, warm water and a soft brush.
3. After each washing, and scrubbing, rub the flesh with vasoline, lanolin, or other ointment to prevent chapping.
4. Keep an individual soft brush and soft towel for your own use. Avoid hard or stiff brushes.
5. Do not wipe the hands with waste; metal particles on the flesh or in the waste may scratch the skin.
6. Have your working clothes laundered at least once a week.
7. Get first aid promptly for all cuts and scratches.
8. Report to your foreman at the first sign of skin irritation.
9. Never permit anyone to spit in the oil pans or reservoirs, or contaminate the cutting fluid in any way.



SAFETY INSTRUCTION CARD No. 304

Food Service

IN-PLANT FEEDING facilities have become definitely established in industry. Some plants had established cafeterias and canteens long before World War II and others found it advisable to start them during the war when new plants were built a long way from restaurants and public eating places near established plants were overtaxed.

Types of Service

Industrial food services are grouped generally in four classes:

1. Cafeterias that prepare and serve a wide variety of hot foods.
2. Canteens or lunchrooms where wrapped sandwiches and other packaged foods, and perhaps a limited menu of hot foods is dispensed. Often these are serviced by industrial catering companies.
3. Mobile canteens that dispense hot or packaged foods along established routes through the plant.
4. Box lunch service.

Food service may be operated by the company or by an industrial catering concern.

Location. Convenience for the largest number of patrons, efficiency of supply and operations are points which often govern the choice of a location.

Clean and pleasant surroundings are second only to quality of food. Workers should be able to sit down and eat in atmosphere conducive to enjoyment and good digestion. Lighting and ventilation are important.

In larger plants cafeterias are often used for safety meetings and other gatherings for business or pleasure.

Canteens offer less elaborate menus than cafeterias, but investment in equipment and operating costs are considerably lower.

Where only limited quarters are available for lunchrooms, a schedule of staggered lunch hours for different departments is sometimes arranged.

Workers who bring lunches from home and those who patronize box lunch services should have a clean place to eat. Eating in the work places is permissible, though not desirable, when operations do not create any health hazard. Locker rooms may be used if clean and well ventilated.

Sanitation

Strict cleanliness in the kitchen is most important. Patrons who get a glimpse of the kitchen should be reassured by what they see.

All perishable food and beverages should be kept under refrigeration except when being prepared or served. Preemployment and periodic

physical examinations for employees are important health measures.

Dishwashing. Satisfactory results can be obtained with either hand or machine dishwashing, although lower bacteria counts on utensils are obtained by machine washing.

For hand dishwashing required facilities include a two- or three-compartment sink, provision for scraping dishes and disposing of scrapings, prerinsing arrangement, adequate water heating facilities, an effective detergent, trained personnel and capable supervision. Baskets for utensils make it possible to use hotter water than the hands could stand.

Most codes require a bactericidal rinse for dishes after washing. This can be accomplished by immersion in water of at least 170° for at least two minutes. A chlorine solution of 100 parts or more per million is also effective.

Drying with towels is not expressly prohibited but the practice is not recommended.

Newer types of dishwashing machines are efficient in operation and easier to keep clean. Some older models are poorly designed with regard to ease of cleaning. Most machines now have devices to maintain the temperature of recirculated wash and rinse water.

Helpful information for planning and operating food service facilities are often obtainable from local and state health departments and from publications of the U. S. Public Health Service.

Vending machines. Conveniently located coin-operated vending machines provide such items as cookies, candy bars, sandwiches and soft drinks. Some machines dispense hamburgers, frankfurters and coffee heated by electronic devices. Machines should incorporate recommended principles of sanitary design.

Beverages are dispensed either in bottles or in paper cups. The latter method avoids the problem of lost and broken bottles.

Paper utensils for both hot and cold foods and drinks are popular for smaller lunchrooms and canteens and for restaurants handling take-out orders. They avoid the health hazard of poor dishwashing and loss through breakage. Receptacles should be provided for disposal of used utensils.

Paper cups and napkins imprinted with slogans, cartoons and other safety reminders provide another medium for getting safety ideas across to employees.

Nutrition

An employee cafeteria has an opportunity to help workers follow recommended diets. It can offer daily

specials that will encourage choice of proper food.

Diets recommended by nutrition experts should include the "basic 7" foods:

1. Green and yellow vegetables, raw, cooked, frozen or canned.
2. Oranges, tomatoes, grapefruit, raw cabbage or salad greens.
3. Potatoes and other vegetables and fruit—raw, dried, cooked, frozen or canned.
4. Milk and milk products, fluid, evaporated, dried milk or cheese.
5. Meat, poultry, fish or eggs, or dried beans, peas, nuts, or peanut butter.
6. Bread, flour and cereals, natural whole grain or enriched.
7. Butter or fortified margarine.

Rest periods. Principal meals are served in the middle of the working shift but there is growing appreciation of the value of mid-morning and mid-afternoon snacks as a contribution to comfort and efficiency.

Snacks are made possible in a growing number of plants by passes of 10 to 15 minutes to go to the lunchroom. In other plants mobile snack bars are wheeled through working areas, giving each employee a chance for refreshment.

Management. In some plants food service operation is under direction of a health and safety committee of supervisors and workers.

Vending machines usually are operated with a coin that leaves a small margin of profit. Frequently the profit goes to an employees' welfare or recreation fund.

Food and service should be as good, if not better than comparable offerings on the outside. This requires constant supervision, whether the facilities are operated by the company or by a concessionaire. Any slackening of quality in food or service is resented by employees.

Rodent and Insect Control

RATS, mice and insects are responsible for an annual toll of destruction and spoilage that runs into millions of dollars. In addition, these pests are carriers of many diseases.

Ratproof construction helps to keep rodents out of buildings but control measures should cover a wide area. Rodents must be routed out of burrows and hiding places under lumber, scrap and trash piles.

Materials should be stored on racks 8 inches above the floor with 18 inches between rows. Outdoors, materials should be stored on racks 18 inches above the ground and with at least 18 inches between rows.

Permanent control measures are based on the fact that rodents cannot exist without food, water and shelter. This makes good house-keeping vital, inside buildings and in the yard as well. Scraps from the kitchen and from employees' lunches should be placed in covered metal containers. Spilled grain should be swept up daily.

—To page 69

WHY SKIN-TOUGHENING

prevents Athlete's Foot

SHOES CAUSE ATHLETE'S FOOT



The modern shoe is the main cause of athlete's foot, says the U. S. Public Health Service (Bulletin R-674). Shoes soften and devitalize the skin. This soft, dead skin inside a warm dark shoe is ideal soil for the growth of athlete's foot fungus.

FUNGUS SPORES ARE EVERYWHERE

The fungus spores, or seeds, are as common as dust. Some of them are on the skin almost all the time. And when the skin's resistance is low, they grow and multiply. The result is athlete's foot.

The chief danger of athlete's foot is that it causes cracks in the skin. More dangerous germs can then enter the blood stream. Serious secondary infections may result.

DISINFECTING THE FEET WON'T HELP



Attempts to disinfect bathers' feet are "futile, illogical, and potentially harmful," according to skin specialists.* You can't kill all the fungus spores, and you may weaken the skin still more by trying to kill them.

WHAT IS THE ANSWER?

Skin specialists say that the best chance of preventing athlete's foot is to build up the skin's resistance to fungus attack.* A strong healthy skin is your best defense against the ever-present fungus spores.

That is the basic principle of Onox skin-toughening.

*Archives of Dermatology & Syphilology, April, 1942.

WHAT IS ŌNOX?

ŌNOX is an odorless, non-poisonous solution of five beneficial mineral salts. Both laboratory† and controlled tests show that Onox toughens the skin and makes it resistant to fungus attack.

†Pease Laboratories, Inc., New York, N. Y.

IT'S EASY TO USE

Onox is used in a soft sponge rubber mat. One mat serves 50 bathers on a shift. Stepping on the sponge (after showering) forces Onox up between the toes, where it is needed. A good percentage of the salts stay on the skin, even after drying with a towel.

MEN LIKE TO USE THE MATS

The sponge mat is pleasant to step on. It is neat and attractive—no splash, no mess. And Onox is very refreshing to tired, aching feet.

FREE BULLETINS AND LEAFLETS

Free bulletins are sent you each month. These, along with easy-to-read leaflets, explain the need for skin-toughening. Customers report excellent results with this free service material.



Ōnox skin-toughening is used by over 70% of the largest manufacturers in the U.S.A.

ODORLESS
EASY TO
MAINTAIN
NOTHING
TO GET OUT
OF ORDER



**COST IS SMALL—
1¢ PER MAN PER WEEK**

TRIAL OFFER... We will ship any amount of Onox and footmats for 60 days' use. If you and your men are not more than satisfied with results, you owe us nothing. For further information, write, or send coupon.

Ōnox, Inc., 119 Second St., San Francisco 5, Calif.
(Warehouses: Brooklyn, Cleveland, New Orleans, Los Angeles)

Send free catalog—no obligation—about Onox.

☐ We have showers. ☐ We plan to have showers.

Name.....Title.....

Company.....

Address.....

City.....Zone...State.....

Extermination. Temporary control consists of removing the existing rat population by means of traps, gases or poisons. Their natural enemies, such as dogs and ferrets, are not always dependable. This step should precede permanent measures to prevent the rat's migration to other premises.

Calcium cyanide, applied to rat burrows with a foot-pump duster, is an effective poison. It should be used only out of doors. Indoor applications may not provide sufficient moisture to liberate cyanide, thus creating a delayed hazard.

Carbon monoxide from gasoline engine exhaust, chloropicrin and methyl bromide are also effective. Manufacturers of rodent killers provide directions for using them.

Lethal fumigant gases may be applied only by licensed exterminators. These fumigants are used for eradicating weevils, moths, beetles and other insects. Carbon disulfide, which is highly flammable as well as toxic, has been used in controlling weevils in grain.

Red squill, has long been a popular and effective rat killer. It acts only as an emetic on other animals but rats cannot vomit and death results.

Warfarin, a more recently introduced rat killer, is also relatively harmless to most other animals and to human beings. It is used in establishments handling food products where more toxic remedies would be highly dangerous.

Barium carbonate, phosphorus or arsenic compounds, thallium sulfate, ANTU, and sodium fluorosilicate (1080) are also widely used. The latter two poisons must be used with particular caution since no antidote for them has yet been discovered.

Insecticides for agricultural and industrial use are available in liquid, powder and paste form. Newer insecticides have been developed to meet particular problems, the most widely known being DDT. Most of these are relatively non-toxic to human beings but users avoid inhaling dust or spray or getting any of the substance on the skin.

Controlling Noise and Vibration

EXCESSIVE noise in a workplace is more than an annoyance; it can be a definite occupational hazard. Individual tolerance of noise varies but continued exposure causes nervous tension and fatigue. Permanent impairment of hearing may result.

Levels of Sound. The unit of measuring sound is the decibel. The decibel scale is strictly a physical scale. It does not measure the fre-



DUNKING STATIONS!

Here's the "all-time" solution to your plant smoking problem—SIPCO "Dunking Stations." Built for hard industrial use—and abuse! Cigarettes, cigars, matches extinguished immediately—no smoldering—no fire hazard!

Unit No. 1—Heavy aluminum canister, attractive sign, upright and heavy weighted base for use on floors, aisles, etc.

Unit No. 2—Same as Unit No. 1, except without upright and base. Easily mounted on walls, columns and posts.

Unit No. 3—(Not illustrated) Canister alone.

Send TODAY for new illustrated folder which gives complete details.

STANDARD INDUSTRIAL PRODUCTS CO.

DEPT. A

1710 MAIN ST.

PEORIA, ILLINOIS

FIGHT ATHLETE'S FOOT with **SANI-MIST**

in the new scientific
SANI-MISTER SPRAY DISPENSER



AT LAST—effective control of "Athlete's Foot" where it usually starts—in your shower room!

SANI-MIST solution—used in the patented SANI-MISTER Spray Dispenser—relieves discomfort and helps prevent the spread of this infectious disease—helps avert costly layoffs.

Public health authorities call the SANI-MIST method one of the most sanitary treatments ever devised for shower room protection. Each application is fresh, full-strength, never contaminated. A three-second treatment covers user's feet with a refreshing, soothing spray. Simple—safe—and sure!

Sani-Mist, Inc., 1724 Chestnut St., Philo. 3, Pa.

MAIL COUPON TODAY

Sani-Mist, Inc., 1724 Chestnut St., Philadelphia 3, Pa. Please send me complete details on how SANI-MIST can safely and economically fight "Athlete's Foot" in our shower room.

NSN-1

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

1. Step On
2. Mark Time
3. Step Off
THAT'S ALL!

New! PEP-UP IMPREGNATED SALT TABLETS

WILL NOT CAUSE NAUSEA
OR STOMACH DISTRESS

5% EARLY ORDER DISCOUNT

on all orders received
in March. Order now
and be sure! Impreg-
nated Salt Tablets
may be on an allo-
cated basis during the
summer season.



- Controlled (slow) dissolving elimi-
nates nausea
- Starts dissolving immediately
- Dissolves completely in about 100
minutes
- No delay in getting salt into
system
- Withstands high temperatures
and rough handling
- Can be stored for long periods
without deteriorating
- Will not absorb moisture from air
and clog dispensers
- Meet government specifications
for Type III, Class D, Impregnated
Salt Tablets

Write for literature and prices

EXPENDABLE DISPENSER

PEP-UP Impregnated
Salt Tablets come to
you in sanitary, fac-
tory sealed Dispens-
ers at no extra
cost. THROW AWAY
DISPENSER WHEN
EMPTY. HANG UP
A NEW ONE. Save
the cost of purchas-
ing, servicing and
replacing individual
dispensers.



UNITED STATES SAFETY SERVICE CO.

KANSAS CITY 6, MISSOURI BRANCHES IN PRINCIPAL INDUSTRIAL CITIES
In Canada PARMELEE, LTD. Toronto



ACE SALT TABLET DISPENSER NEW—DIFFERENT ECONOMICAL SANITARY 95% GLASS AND PLASTIC STRONG—SIMPLE FOOL-PROOF

The last word in salt tablet dispensers. Holds 750
10-grain tablets. Price \$2.50 each, Postpaid.

ACE MANUFACTURING COMPANY

DIVISION OF
AMERICAN DEVICE MFG. CO.
RED BUD, ILLINOIS

quency, which also affects the sensa-
tion felt by the ear.

In general, the higher the fre-
quency, or pitch, of the sound, the
more trying it is to the ear.

Between zero and 10 decibels is
the threshold of audibility.

From 10 to 75 decibels is within
the comfortable hearing range.

Noise above 90 decibels is con-
sidered injurious to the hearing and
nervous system. At 120 it becomes
acutely painful.

Noise Makers. Here are some noise
levels recorded at three feet from
various machines:

- Punch presses—96-103.
- Drop hammers—99-101.
- Hydraulic press—130.
- Automatic riveters—95-99.
- Lathes—80.
- Automatic screw machines—93-
100.
- Airplane riveting guns—94-105.
- Airplane propeller grinding—100-
105.
- Looms—94-101.
- Wood planers—99-110.
- Wood saws—100.

The accumulated effect of smaller
noises may also create an excessive
total.

Measuring levels. Where noise is
present more or less continuously it
is recommended that operations be
tested with an approved sound meter.
If a meter is not available, it may be
assumed that noise is excessive where
it is necessary to carry on conversa-
tion by shouting.

Methods of Control. Substitution
of a less noisy process, such as weld-
ing for riveting, is sometimes pos-
sible. But in most operations there
are four methods of attack:

1. Isolate vibrating machines by
putting them on damping mounts of
rubber, cork, springs, or other mat-
terial.
2. Enclose noisy operations in in-
sulated rooms.
3. Apply acoustical treatment to
walls and ceilings.
4. Maintain machinery to avoid
noise from worn and loose parts.

Frequently it is necessary to use
a combination of measures.

Keeping floors in good condition
and free from bumps is helpful. Rub-
ber tires on hand and power trucks
also make operations quieter.

Personal Protection

Ear Stopples. Where noise cannot
be reduced to a comfortable level at
the source, ear plugs or stopples often
afford considerable relief. These are
made of plastic, rubber or wax.

Stopples properly made and fitted
have reduced noise from 25 to 30
decibels while permitting ordinary
conversation.

Ventilation

—From page 52

a discharge duct. Air from the main duct of the exhaust system, under high velocity, enters the large chamber where the air is given a circular motion. The heavier particles are thrown to the outer wall by centrifugal force and fall along the wall. Air escapes through the top.

A combination of viscous filter and electrostatic precipitation with a self-cleaning feature on some models is available. It solves the problem of dust capacity and of heavy particles.

Cyclones are most effective for large particles, such as sawdust, shavings, heavy lint, etc. After passing through them, air cannot be returned to the workroom without further filtering. Cyclones are relatively inefficient for removing small particles.

Dynamic separators combine a fan and collector in one unit. In form this type of separator is somewhat like a cyclone, but the centrifugal separating action is performed by the revolving blades. It is more efficient than the cyclone.

In some types water spray is introduced with the dust at the inlet. Wet collection increases efficiency for fine dusts.

Wet collectors use several devices for obtaining contact of water with the exhausted air so that dust particles form a sludge. One type consists of sprays or water curtains through which dust-laden air is drawn. These are efficient collectors for many types of dust. An important application is in the control of dust explosions from powdered aluminum or magnesium.

Supersonic flocculation. Suspended dust is passed through a field of supersonic vibrations, inaudible to the human ear, generated by a high-frequency siren. Vibration flocculates the fine particles and the aggregates are then collected by cyclones or other measures for collecting relatively coarse particles.

General Safety Measures

Personal protective equipment is needed where exposure is occasional or where complete protection is not practicable. Removal of the hazard at its source should remain the objective.

Sanitation and housekeeping must receive constant attention. Otherwise equipment will lose its effectiveness and unhygienic conditions develop.

Supervision and training of employees, particularly in hazardous operations, is important. Workers exposed to toxic substances should receive frequent physical examinations.

Before the HEAT HITS!

NOW is the time to stock up on hot weather supplies. Play safe! Contact STASAFE! Salt Tablet and Dispenser Headquarters.

STASAFE ALL-METAL DISPENSERS

Simple — Sturdy — Sanitary! StaSafe dispensers are made of a corrosive resistant alloy — Carry a five year guarantee against mechanical failure — Are easy to operate. They come equipped with lock and key — wall bracket — inspection window. The StaSafe Junior holds 1,500 tablets. The Midget — 600.



JUNIOR



MIDGET

FAIRWAY PLASTIC DISPENSERS

Made of molded plastic, these Fairway dispensers are Moisture, Dust, and Corrosion resistant. They protect your tablet supply from contamination. All Fairway plastic dispensers have a visible tablet discharge control — are furnished with lock top, key, mounting bracket and screws. The Junior holds 1,500 tablets. Midget — 350.



MIDGET



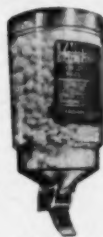
JUNIOR

FAIRWAY CRYSTAL DISPENSERS

Popular demand — Crystal throw-away type. Inexpensive — Sanitary! The Crystals are filled with enteric coated salt tablets and sealed in at the factory. When the tablets are gone, just throw the dispenser away. The Crystal holds 500 tablets. The Crystal-M — 1,000.



CRYSTAL



CRYSTAL-M

FAIRWAY TABLETS

For the prevention of heat sickness due to loss of salt — order regular salt, combination salt and dextrose or either style enteric coated. Workers everywhere need little encouragement to beat heat fatigue with salt tablets when the tablets are FAIRWAY.

Before the Heat Hits! Order Now!

Send For Informative Booklet No. 537



STANDARD SAFETY EQUIPMENT COMPANY

232 WEST ONTARIO STREET

CHICAGO 10, ILLINOIS

NEWARK 4, N. J.
597 BROADWAY

CLEVELAND 6, OHIO
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LOS ANGELES 16, CAL.
2952 CRENSHAW BLVD.

EYE WASHING FOUNTAIN



SAVE EYES!

Leading industrial doctors advise immediate washing with plenty of running water as the best first aid treatment for any chemical in the eyes. Records prove that washing with water for ten minutes or more, close to the accident, is necessary to reduce or eliminate eye damage.


Forehead operation leaves hands free to open eyelids so water can be directed where ever chemicals might be lodged. Sanitary white baked enamel bowl is resistant to most fumes.

Over 500 industrial plant installations have been made to date.

Write For Details.

VALVE Chain Operated Quick Closing Self-Closing

NEW EMERGENCY SHOWER



Deluge of Water 30 to 40 G.P.M.

The B & A Shower is the quickest and most satisfactory way to saturate a worker with gallons of water the instant an accident occurs, to prevent a disfiguring burn—even a fatality.

Special shower head, no holes to clog—can be used where unfiltered water prevails.

Write For Details.

GLASS SLIVERS AND CHEMICAL IN EYES!

DISFIGURING FACIAL CUTS AND BURNS!

CUTS AND CHEMICAL BURNS ON ARMS AND BODY!

THIS HAPPENS WHEN UNPROTECTED GLASS BOTTLES ARE BUMPED

NEW LOW COST B & A SAF-T-BAGS



are widely used for the safe handling of glass bottles containing harmful chemicals; also the storage and recovery of expensive serums, biologicals, and other costly products.

Painful cuts, disfiguring burns, loss of eyesight, or even a fatality, do result from corrosive liquid splash and flying glass when unprotected bottles shatter.

Write For Details.

5 PINT 1 GALLON 5 GALLON

BENSON & ASSOCIATES, INC.
P.O. Box 7942, Dept. N5, Chicago 90, Illinois

Industrial Panel

—From page 5

upon return of the old pair. Chain-men and hookers are given white hard helmets which they keep at all times. A shotblast helmet is issued to each shot blaster. He keeps it in his locker and is expected to take care of it. Helmets are cleaned and repaired by the safety department when necessary.

Safety shoes, welders' gloves, leather aprons, leather sleeves and cotton work gloves are stocked by the safety department and are sold to employees at actual cost. These items may be bought for cash, and, except for work gloves, by payroll deduction.

Since the safety department is responsible for the ordering, storing and issuing of protective equipment, it is necessary that we have sufficient stock to meet any situation. The safety engineer is responsible for keeping an adequate stock.

He also is in charge of four employees who distribute, repair and clean safety equipment. We have trained these people to do a good job because we believe they can help in getting people to wear their protective equipment.

Good, clean equipment, properly dispensed is the first step in a protective equipment program.

MR. KRAMOS:



Safety glasses (spectacle type) are issued by our nurse to every person the day he begins work — loaned for the duration of employment. If an employee needs corrective lenses our company will pay for them, but he must furnish his own prescription from any reputable doctor he may choose. Repairs and adjustments to safety glasses are made by the nurse each day at designated hours.

Safety goggles (cupped and cover-all type, plastic shields, etc.) for use on special jobs such as gas cutting, gas welding, chipping, belting, grinding, etc., are maintained in our tool crib. Any employee can get a pair by depositing a tool check with the tool crib attendant. Before they are issued goggles are sterilized by our nurse and placed in a sealed paper container. Used goggles are taken to our medical dispensary for repair, cleaning, and sterilization before they are returned to the tool crib for reissue.

Respirators (painting and dust) are dispensed in the same manner as safety goggles through the tool crib and sterilized by our nurse.

Each welder must furnish his own welding helmet as part of his job. We do, however, furnish replacement lenses for those helmets.

Stations for cleaning eye-protection equipment are conveniently located throughout the factory and are serviced daily by our maintenance department.

MR. FISKE:



We have certain operations that call for compulsory eye protection. This covers such operations as grinding, galvanizing, which is a hot dip operation, chipping concrete, or any operation where air is used to eject the work. In these cases and many others, goggles with side shields are given out.

In our drop forge plant a trained attendant is responsible for dispensing goggles. In divisions where such an attendant is not present, they either are given out through the stockroom or by a trained nurse from the first aid department.

The employee gets goggles through a requisition from his foreman. All plain goggles are given free-of-charge. We defray half the cost of prescription lenses, frames and steel case, only where side shields are provided and left on. We feel that where shields are part of the equipment, the employee gets 98 per cent protection—without, only 60 per cent.

Clean— kill odors— kill germs— at the same time

OAKITE TRISANITE does these three jobs in one application. Leaves no disinfectant smell—has no odor, leaves no odor. Tops for washrooms, lavatories, shower stalls, lockers, first aid rooms, etc. Average solution costs less than 1½ cents a gallon.

Ask your local Oakite Technical Service Representative for demonstration, or write.

OAKITE PRODUCTS, INC.
140 Thomas Street, NEW YORK 6, N. Y.
Technical Service Representatives Located in Principal Cities of United States and Canada

OAKITE

SPECIALIZED INDUSTRIAL CLEANING
MATERIALS • METHODS • SERVICE

Many types of goggles are kept in stock, such as plastic, metal frames, leather padded frames and welding goggles. In addition, plexiglas goggles are available. The latter in most cases can be worn over regular personal glasses if needed. These, too, are furnished free but a charge of \$1 is made if such items are not returned at termination of employment.

Other personal protective equipment items are provided on requisition from the foreman. They are mainly rubber aprons, protective hats and hair nets for the women employees, rubber boots, various types of respirators, rubber and plastic gloves. In some unusual cases, special heavy asbestos gloves are provided for hardening of small dies and tools. Full-sized and half-size face shields are provided where necessary. Protective creams are used in connection with galvanizing, pickling and plating operations.

In some types of grinding, gloves are furnished free beyond the first pair each week. On some buffing operations where stainless steel is used, gloves are provided free. Rubber boots and rubber aprons are used principally in pickling and plating operations.

Personal protective items which the employees buy are mainly safety shoes, leather welders' jackets and aprons, and most types of gloves. One division makes gloves available to employees at 50 cent a pair. The company assumes the balance of the cost. In other situations they are made available from the stockrooms at cost.

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Before the HEAT HITS!

NOW is the time for you to check your supply of Fairway salt tablets.

Why? Because the heat is coming and when the heat hits, it hits hard. It hits your profits! How? Work slow-downs, inferior workmanship, and lost time accidents are often directly caused by heat and heat fatigue.

Fortunately, most of this heat trouble is avoidable if you make Fairway salt tablets available to your workers. Fairway tablets restore the salt balance in bodies drained of salt by perspiration.

For stomachs sensitive to salt, we suggest Fairway Enteric coated tablets. Enteric tablets resist the acid solutions of the stomach and dissolve in the alkaline fluid in the intestinal tract.

100% PURE SALT TABLETS. COMBINATION SALT AND DEXTROSE. ENTERIC COATED SALT TABLETS.

ORDER NOW!

Write For Bulletin No. 540

STANDARD SAFETY EQUIPMENT COMPANY

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NEW! CHICAGO HARDWARE FOUNDRY 313 Universal Table!



Lifetime CAST IRON CONSTRUCTION
Colorful Porcelain Enamel Finishes

You'll like the colorful, attractive appearance of this new "CHF" table . . . and the fact it's built to give a life-time of service! Cast iron channel legs and center stringer give necessary strength without bulky bases. Easier, quicker to clean around with more chair and knee room. Available in sizes to seat 4 to 20 people. Your choice of lifetime porcelain enamel colors and standard tops. Portable—or can be secured to floor for use with permanently attached counter stools.

Write for Complete Information and Prices Today!

THE CHICAGO HARDWARE FOUNDRY CO.

"Dependable Since 1897"

1032 COMMONWEALTH AVE., NORTH CHICAGO, ILL.



2 for 1

RADIATION SURVEY METER



...for Plant CD Protection

Tracerlab's SU-10 Radiac is a wide range survey meter designed to Armed Forces specifications. It is the only instrument of its kind approved by the FCDA. The Radiac has five scale ranges of 5, 50 and 500 milliroentgens per hour and 5 and 50 Roentgens per hour. These scales are arranged in order of increasing sensitivity; have different colors; are automatically changed when the scale is switched, so that only the selected scale is visible.



...for Radiography Monitoring

For protection of foundry and other personnel engaged in radiography with radioactive Cobalt-60, X-ray or radium, it is necessary to monitor working areas. Many Tracerlab Radiacs have been sold for this purpose. Because the instrument is submersible and shock proof and is designed to operate under severe temperature and humidity conditions, it is ideal for industrial use. Overall instrument accuracy is $\pm 15\%$ of the meter reading anywhere on the scale.

Ask for bulletin NSN

Tracerlab
130 HIGH ST., BOSTON, MASS.

Sales Offices:
Berkeley, Cal. • Washington, D. C.
New York, N. Y. Chicago, Ill.

The matter of subsidizing safety shoes is being considered. Upon inquiry I find the amount allowed by numerous companies varies considerably. Where safety shoes are compulsory, one large national industry pays one-half the cost. Others pay from \$1 to \$3 toward the cost.

Control of inventory and re-ordering is the duty of the stockroom keepers in two instances and to the attendant of our goggle service in another. They keep a daily record of the various items. This shows them the stock on hand and the time when re-orders should be made. It is always advisable to order early.

I have always found that showing real interest in the employee's problems by providing proper personal protection does much toward gaining his interest in our safety movement.

MR. QUEENER:



While we do not have a standard procedure for maintenance and distribution of personal protective equipment in our various plants, a policy generally followed is that when-

ever its use is required by safety or operating rules, the equipment will be furnished.

Equipment of this type would include safety spectacles, chemical goggles, welding helmets, hard hats, acid hoods, respirators, gas masks, rubber gloves, rubber aprons, life belts, safety harnesses, asbestos suits, etc. They usually are issued from a storeroom on a credit memorandum or tool check and returned whenever the job is completed.

Safety spectacles are generally obtained from the plant safety department and are fitted to the employee by an experienced technician. The type of spectacle, date, and name of employee to whom issued are recorded and this equipment is returned upon termination of employment. Prescription safety glasses are handled in the same manner, except that the employee must furnish a recent prescription at his own expense.

Where toe injuries might occur, the use of safety shoes is encouraged and various inducements are made to have employees purchase them through the plant storeroom, or in smaller plants at local retail shoe stores. Since safety shoes are the personal property of the employee, no further records are kept except periodic surveys by the foreman as to the number of employees wearing this form of toe protection.

In order that life belts, hard hats, acid equipment, gas masks, etc., will be in good condition when needed, inspections varying from daily to semi-annually are made by the safety, maintenance, or storeroom personnel.

—To page 145

FOOD is an IMPORTANT FACTOR in INDUSTRIAL SAFETY

The word "accident" means "that which happens without one's intention."

Those who visit your plant hospital or first aid room did not "intend" to be injured, but someone contributed to the cause of their injury by lack of attention; loss of interest; not being alert.

Nutritional experts have learned through many years of study and research that improper eating habits destroy the individual's natural alertness, creating lack of attention and loss of interest—which are the underlying causes of almost every "accident." Meals served in plant cafeterias should provide one third or more of daily food requirements. There is no way of forcing workers to eat properly, but food that is attractive and appetizing in appearance sells itself.

With a proper, hot and nutritious meal under their belts, the men and women in your plant will go back to their jobs alert and keen to do a good job. We can help you set up the right type of food service in your plant, as we have helped so many other industrial organizations.

NATIONWIDE FOOD SERVICE now operates in-plant cafeterias for more than 150 industrial plants in 28 states. Trained engineers on our staff will help you design new cafeterias or remodel old ones. Trained food technicians will school cafeteria workers in the best food preparation techniques.

Good food service in your plant will pay handsome dividends in

**Decreased Accident Rate
and
Increased Production.**

We will be glad to help you solve your food service problems.

Nationwide Food Service, Inc.
18 S. Michigan Ave., Chicago 3

Division offices in many principal cities
throughout the country.

Eye Conservation

INDUSTRIAL operations expose the eyes of workers to a variety of hazards, including flying objects, splashes of corrosive liquids and molten metals, dusts, and harmful rays.

Injuries to the eyes result in a high degree of disability and often disfigurement. Cost per injury from the standpoint of medical treatment and compensation is high, and total cost to employers and employees is heavy.

Some eye hazards can be controlled at the source by means of enclosed processes and shields on equipment. Many eye injuries, however, are caused by casual flying particles in occupations considered non-hazardous.

For this reason, some companies have introduced eye protection for all employees and visitors. Many of these companies have reported substantial savings through eyes saved. Few accident prevention programs have produced measurable results as eye protection.

General types of protective equipment for eyes and face include:

1. Goggles (safety glasses)
2. Face shields
3. Welding masks and helmets
4. Acid hoods

These devices are available in many types for practically every occupation. The protective medium may be heat-treated glass, transparent plastic, wire screen, or light-filtering glass.

A complete program of eye conservation includes both protection against injury and correction of visual defects which reduce efficiency and increase liability to accident.

Visual surveys. For pre-employment examinations and periodic re-examinations there are devices which indicate the visual status of the individual. Manufacturers of this apparatus have prepared systems which use the data obtained from the tests in determining the fitness of the employee for various occupations.

These tests may be given by trained laymen. Their purpose is to detect visual defects, not to prescribe for them. Those needing corrective lenses are referred to refractionists (ophthalmologists or optometrists) to be fitted with glasses.

In prescribing corrective lenses, whether for safety goggles or ordinary spectacles, the refractionist should be familiar with the needs of the job. It is particularly important to know the distance of the working level from the eye.

Corrective goggles. For visual defects, the wearer may have the correction ground in heat-treated lenses, or cover goggles may be worn over spectacles.

For most cases corrective goggles are preferable for optical reasons as well as convenience. Most prescriptions can be ground in protective glass.

Cover goggles are often preferred where a near-sighted person requires deep minus lenses. These would be excessively thick at the edges and too thin for adequate protection at the center. Cover goggles also have advantages where the correction is complicated and the lenses would be subject to pitting on the job.

Familiar types of cover goggles are the cup type with heat-treated glass lenses and the wide vision type with plastic lenses.

Types of Goggles

Heat-treated lenses fitted in spectacle frames or cup goggles offer basic protection. The nature of the job and the eye hazards involved determine the specifications.

Miners' goggles of non-corrosive wire screen are used for work underground and in other locations where fogging is a serious problem. The screen is coated a dull black to reduce reflection.

Spectacle goggles are recommended for light or moderately heavy work, such as grinding, machine work and assembling where working positions are not too close.

The frame must be rigid enough to hold the lenses in proper position in front of the eyes. The nose bridge should be adjustable, or goggles should be available in enough sizes to fit various faces.

Side shields of metal or plastic provide protection against light objects flying from the side. They should be used where operations are close together, or where employees work together on the same operation.

Cup goggles are used for heavy grinding, machining, chipping, riveting, work with molten metals, and similar operations.

The cup should be wide enough to protect the eye socket and distribute the impact from any blow over a wide area. The cup should be flame-proof, corrosion resisting, and non-irritating to the skin.

Mask-type goggles, with frames of soft vinyl or rubber, offer protection against splashes of corrosive chemicals and exposure to fine dust. This type is obtainable with lenses of

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Visual screening test is an important part of eye conservation program. (Anaconda Wire & Cable Company)

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Respiratory Protection

RESPIRATORY equipment protects the worker against inhalation of air contaminants. These range from the relatively harmless "nuisance" substances to toxic dusts, vapors, mists and gases.

Removal of contaminants at the source and enclosure of processes helps to keep down concentrations of harmful substances in the work-room air. However, leaks and breakdowns may occur, and there are operations where exposure is brief or infrequent. For such contingencies, personal protection should be provided.

The worker's air intake may be safeguarded by three principal methods:

1. Mechanical filters to remove dusts and mists.
2. Absorption or chemical reaction to remove gases and vapors.
3. Supplied air.

Types. Four general types of respiratory equipment are:

1. Canister gas masks.
2. Chemical cartridge respirators.
3. Filter respirators.
4. Supplied air equipment (those masks and air-line respirators).
5. Self-contained apparatus supplying oxygen or air.

Each type of equipment has a definite field of usefulness, as well as limitations. Manufacturers and dealers want to know the type of exposure when equipment is ordered.

Approval. Equipment which meets accepted standards carries the label of the Bureau of Mines. Approval specifies type of exposure as well as design and construction.

Gas Masks

A gas mask consists of a face piece connected by a flexible tube to a canister. Inhaled air is drawn through the canister which cleans it chemically. No one chemical has been found which will remove all contaminants so the canister must be chosen for the exposure.

Canister gas masks with full face piece are for emergency protection in atmospheres immediately dangerous to life. Their effectiveness is limited to 2 per cent by volume. An exception is ammonia for which the limit is 3 per cent.

Identifying colors. Canisters of gas masks are painted as follows:

1. Black—Organic vapors.
2. White—Acid gases.
3. Yellow—Organic vapors and acid gases.
4. Green—Ammonia.
5. Brown—Organic vapors, acid gases and ammonia.
6. Red—Universal; all industrial gases, including carbon monoxide, smoke and fumes.

7. White with green stripes—Hydrocyanic acid gases.
8. White with yellow stripes—Chlorine.
9. Blue—Carbon monoxide.

Cartridge Respirators

Chemical cartridge respirators usually have a half-mask face connected directly to a small container. Chemicals are similar to those used in gas masks.

Cartridge respirators are used only for non-emergency situations—for atmospheres which are harmful only after prolonged or repeated exposures.

Filter Respirators

Protection against any form of particulate matter can be provided by a mechanical filter respirator of proper design. Major items to be considered are resistance to breathing offered by the filter element, adaptation of face piece to faces of various shapes, and fineness of particles to be filtered out.

ASA Code Z-2 requires that the complete respirator show a resistance not in excess of 50 mm. of water to inhalation at a rate of 85 liters of air per minute. Resistance to exhalation under the same conditions may not exceed 25 mm. Commercial respirators are usually held to considerably lower resistances.

Specified types of filter respirators are approved for protection against inhalation of non-toxic or nuisance dusts. Other types are used for silica and other pneumoconiosis-producing dusts, toxic dusts, vapors and mists.

Mechanical filter respirators are not effective against solvent vapors, injurious gases, or oxygen deficiency.



Tank-cleaning crew about to enter storage tank which had contained tetraethyl leaded gasoline. Men are equipped with blower type hose masks, rubber gloves and boots. Air is supplied through hose lines by means of blower located a safe distance from toxic vapors. Double inhalation tubes pass over shoulders. Should one tube be constricted, air will still flow through the other. (Mine Safety Appliances Company)

Hose Masks

Atmospheres immediately hazardous to life require air supply from a point beyond the contaminated area. With a hose mask, air is normally supplied by a blower. The wearer can inhale through the hose when the blower is not operating.

As a rule, **hose lines** (with at least a 1-inch connection) are recommended rather than **air lines** with connection to a compressed air system. In a case of failure of air supply, it is possible to breathe through a considerable length of hose.

Hose masks are not approved with more than 150 feet of hose or where inhalation resistance exceeds 2.5 inches of water, or the exhalation resistance exceeds 1 inch of water.

Attachments of additional hose should not exceed the total prescribed length and should be approved for use with that type of mask and should have approved couplings.

EYE, HEAD AND RESPIRATORY PROTECTION—DEFINITIONS National Bureau of Standards Handbook H24

Protector—A device placed in front of or over the eyes, face or head to afford protection from the hazards in industrial processes or from the natural elements.

Goggles—An optical device worn in front of the eyes, whose predominant function is protection to the eyes only.

Face Mask—A device worn before the eyes and a portion or all of the face, whose predominant function is protection to the eyes and face.

Helmet—A rigid device worn by the operator which shields the eyes, face and neck, and a portion or all of the other parts of the head and is held in place by suitable means.

Hood—A non-rigid device which completely covers the head, neck and portions of the shoulders so as to exclude dust and flying particles.

Shield—A device to be held in the hand, or supported without the aid of the operator, whose predominant function is protection to the eyes and face.

Gas Mask—A device to be worn on the face, and so arranged that the inhaled air is drawn entirely through a canister which cleans it chemically.

Supplied-Air Respirator—A device designed to supply the wearer with air suitable to breathe while surrounded by a contaminated atmosphere, and to prevent the latter from being inhaled.

Hose Mask—A supplied-air respirator having a tight-fitting facepiece to which is attached a hose through which air may be forced by a blower, and through which the wearer can inhale whether the blower is operating or not.

Air-Line Respirator—An air-line respirator is a supplied-air respirator designed to be connected by a hose to a supply of fresh air under positive pressure sufficient to maintain a continuous flow into the facepiece.

Filter Respirator—A device designed for the wearer to inhale the surrounding atmosphere after it has passed through a filtering medium to remove the impurities. The filtering medium may chemically absorb or mechanically obstruct the impurities.

Cartridge-Type Respirator—A filter respirator whose filtering equipment is carried in one or more cartridges mounted on the facepiece. Such a respirator may be a mechanical filter respirator, a chemical filter respirator, or a combination of both.

The hose mask should always be used for work which involves entering tanks or pits where there may be a dangerous concentration of dust, mist, vapor, or gas, or oxygen deficiency.

Harness to pull the hose lines requires inspection prior to use. The minimum requirement is that component parts of harness shall withstand a pull of at least 250 pounds.

Air-Line Respirators

Air-line respirators, connected to compressed air-lines, provide essentially the same protection given by hose masks. They are not intended for atmospheres immediately hazardous to life where the wearer could not escape if failure of the air supply required him to remove the respirator.

This respirator differs from the hose mask mainly in two features: It has a hand-operated, quickly detachable coupling connected to the belt or body harness so that the operator can connect to a compressed air hose, also a flow-limiting device with capacity to permit air flows only between 2 and 20 cubic feet per minute.

A trap and filter installed in the compressed air line ahead of the masks to separate oil, water, scale, or other extraneous matter from the air stream is desirable.

An air-pressure regulator in the line is required if air is supplied at a pressure in excess of 25 pounds per square inch and, in addition, a pressure release valve which will operate if the regulator fails.

Supplied-air respirators are the most desirable for operations requiring continuous use of a respirator. Other types may give adequate protection, but they offer breathing resistance and are consequently more fatiguing.

To obtain clean air, the compressor intake must be kept away from all sources of contamination. The compressor should be well maintained. It must not run too hot, as dangerous amounts of carbon monoxide can be produced by decomposition of lubricating oil.

Abrasive Blasting

Abrasive blasting requires not only an adequate supply of filtered air.

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Hard hats prevent injuries to workers loading car bodies. Lights on hats provide illumination in dark freight cars. (Fisher Body Div., General Motors)

standard colors—white, gray, red, green, blue, brown and black. Other colors are available on special order. Color is permanent because it goes all the way through the material.

Special colors are sometimes ordered to match the company's color used on vehicles, in advertising, etc. Others use distinctive colors and designs to designate the wearer's department or trade. This is important in large plants where certain areas are restricted to a few carefully selected employees.

For Women Workers

Woman's hair has always been a problem around moving machinery. Much effort has been expended in designing headwear that would be both protective and decorative.

Scalping injuries are likely to occur at points where the hair may come in contact with moving shafts, belts, pulleys and the like, or where enough static is produced by the machine to lift the hair.

Covering the machine may suffice in some operations but women who work around such machinery should wear caps which completely cover the hair. Hair covering is desirable also in the interest of cleanliness.

Hair coverings should be made of a fabric sufficiently durable to withstand regular laundering and disinfecting by commercial methods. Design should be simple so that pressing or ironing may be done by machine.

Caps should be provided in a sufficient variety of head sizes, or with a sufficient range of adjustment in the head size to fit all persons.

Flame-resistant material should be used near sparks or flame. Caps with peaks provide some warning before the head comes in actual contact with a moving object.

Hair nets or turbans, preferred by many women, are not considered sufficient protection around moving machinery.

Head Protection

PROTECTIVE HATS are needed on jobs wherever heads are menaced by falling objects. These hats are widely used in the mining, lumbering, construction, shipbuilding and petroleum industries, and for certain occupations in other industries.

Protective hats are also useful where there is danger of bumping the head against overhead structures.

Resistance to impact is the most important essential for these hats. They must also be fire resistant and impervious to moisture. Where contact with electricity is possible, the material should be non-conductive.

Types. A hat with a brim all the way around provides the most complete protection for the head, face, and back of the neck. For confined spaces where a brim might be in the way, the cap type may offer adequate protection.

Some models have brackets to support welding masks or miners' cap lamps.

Materials. Laminated plastic molded under high pressure is a widely used material. It is resistant to impact and to effects of water and oil. Dielectric strength is high.

Glass fiber impregnated with resin is a recently introduced material. It has a high strength-weight ratio, high dielectric strength and resistance to moisture.

Hats which glow in the dark, due to a phosphorescent pigment, are obtainable on special order.

Aluminum alloy meets all requirements except dielectric strength. Metal hats should not be worn where there is danger of electrical contact.

Weight. Not more than 14½ ounces for the complete hat is specified by the Federal Treasury Department, Procurement Division, in Specification No. 367A. The specification also lists several tests which hats must pass. These include moisture, impact and electricity.

The hard outer shell of the hat is supported by a cradle or hammock which keeps the shell away from the head and cushions it against blows.

Cradle and sweatband should be replaceable because of deterioration when exposed to perspiration for long periods. This is also important for sanitary reasons, especially when the hat is worn by more than one person. The shell can be sterilized by any of the common methods.

For cold weather a winter lining may be attached to the hat. This lining is made of water-resistant cloth to protect head, neck and ears.

Where the wearer may be exposed to strong winds on such locations as bridges and oil derricks, the chin strap is a useful accessory.

An eyeshield of transparent plastic can be attached to some types of hats. It is hinged under the peak and lies flat against the peak when not in use.

Colors. With some manufacturers, hats are now available in seven

Foot Protection

FOOTWEAR for the industrial worker must protect the worker against moisture and hot substances, rough surfaces and sharp objects underfoot, and falling objects. Shoes must be durable, properly fitted and comfortable. Many types of industrial shoes meet these requirements.

Footguards supplementing safety shoes are worn for more severe exposures.

Safety shoes. As generally used, the term means shoes with reinforced toecaps. These are available in a variety of styles for men and women.

Steel toecaps are specified for most occupations because of their ability to resist heavy blows.

Fiber and plastic are used for shoes worn around electric equipment where resistance to impact is secondary to the need for insulation.

Standards. American War Standards, Z41 Series, of the American Standards Association, are still the accepted guide for purchasers of safety shoes for men and women.

Specifications call for a well-constructed, durable work shoe with the toe reinforced with a steel cap. The cap is supported on a flange resting on the sole. It must support a static load of 2500 pounds and resist the impact of a 50-pound weight dropped one foot. When subjected to either test, the inside of the toecap must not come closer than one-half inch from the upper surface of the sole.

Strength requirements for shoes for both men and women are identical.

Shoes meeting these requirements bear an identification stamp on one shoe of each pair. The stamp indicates the type of shoe according to the code classification.

Distribution

To secure acceptance of foot protection, safety shoes must be comfortable and properly fitted. Purchasing must also be made convenient.

Many of the larger companies maintain well equipped stores with a wide range of lasts and sizes and trained attendants to fit the shoes. Shoes are sold at cost and employees may buy them on the payroll deduction plan. Safety shoes are sometimes awarded as contest prizes.

Smaller plants are not always in a position to stock an adequate range of sizes or provide expert fitting service. Many companies have made arrangements with local shoe dealers whereby employees may select shoes and pay through payroll deduction.

A mobile shoe service is offered by dealers in some areas. A truck equipped as a shoe store is manned by an experienced fitter who is re-

sponsible for all adjustments. A variety of styles and a full range of sizes is carried. Periodic visits are arranged and between visits shoes can be obtained quickly on special order.

This service is rendered on a moderate mark-up basis and the plant can charge the employee any part of the cost.

It is desirable for a worker to have more than one pair of safety shoes so they can be rotated. The shoes will last longer and be easier on the feet. The wearer will also have a pair available while the other is being repaired.

Types of Shoes

Safety shoes. Generally, are well made on lasts designed for foot comfort. They are available in many types and styles, some suitable for street wear. The protective toecap does not add appreciably to the weight or cost of the shoe.

General purpose shoe. The most widely used type is the blucher, in either high cut or oxford styles. It is available in a wide range of sizes, widths and lasts, ranging from rugged, heavy-duty styles to those suitable for street wear. It is the basic type, with certain differences in detail for special occupations.

Foundry shoes. An early type of safety shoe was the foundry shoe with elastic panels at the sides. There is no opening on the instep where molten metal or hot sand can penetrate and the shoe can be pulled off quickly in an emergency. This model is furnished with steel box toe.

Spark-proof shoes. Shoes with brass hooks and eyelets and brass

nailed heels are worn in some industries where sparks from iron or steel might ignite flammable gases.

Shock-resisting shoes. Some are non-metallic with fiber box toes; others have steel box toes which are partially insulated. These shoes are designed for work around electric current. They are also worn by those handling flammable materials, by workers in explosives plants, and in grain products refining operations.

Conductive shoes are designed to ground body static and prevent its building up to the body to the point where it could cause a spark.

The conductivity of these shoes is affected by other conditions. Wool, natural silk and nylon socks act as insulators to the body; cotton, lisle or rayon are satisfactory. Foot powder also serves as an insulator. The floor as well as the shoes must be a conductor.

Rubber footwear. Where work must be done in deep mud or in water, rubber boots contribute to health, comfort and safety. Rubber boots are available with steel box toes.

Soles and Heels

Leather is comfortable and durable for normal conditions. Oak leather will not give satisfactory service where heat is excessive or where the shoe is subjected to continuous dampness. Chrome tanned leather is more resistant to heat.

Rubber is resistant to moisture, alkalis and most acids. It deteriorates quickly when exposed to grease, oil, solvents, some acids, or excessive heat.

Neoprene is resistant to grease, oil and solvents that would ruin rubber as well as to moisture. It stands up well against cutting and abrasion.

—To page 134



Advertising safety shoes boosted sales to both men and women.



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For more savings and quick service, order "Penoptic" quality industrial lenses *direct*. There's *always* a complete assortment of welding lenses, welding blanks, safety lenses and clip-on goggles in stock! All orders are filled and shipped immediately. No waiting. For more than a quarter of a century the Pennsylvania Optical Company has supplied industrial lenses made by men with experience and know-how in producing precision ground and polished lenses. Write, wire or phone for information on the complete line.

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MonoGoggle

Style No. 1 large nose illustrated.



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Safety Spectacles

Style A series—no sideshields.
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Heavy Duty Cup Goggles

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Rubber Mask Goggles

Style X41 ventilated—
X44 non-ventilated.



Dust and Mist Respirators

Style No. 5D shown.
Style 45D—with large facepiece.



Respiratory Safety Program?

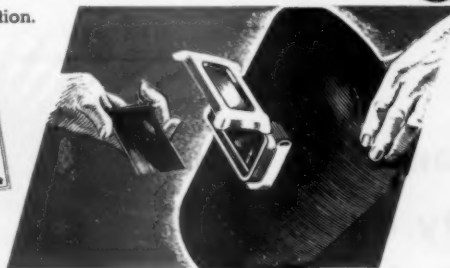
Second, do your workers react favorably to the safety equipment you furnish them? Will they wear it unless you take measures to force them to do so? Try WILLSON protective equipment and you'll find workers more willing to cooperate. It's far better to forestall worker resistance by selecting goggles and respirators which have been designed and proved to provide comfortable wear over long periods. Protection plus comfort pays off in lower accident rates and higher production.

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Popular No. 60S Flip-Front illustrated.



Willson-Weld* Glass

Meets Federal Specifications in all shades from 3 to 14.



Chip-Weld Goggles

Style DCS3 shown above.



Cover-All* Welding Goggles

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Chemical Cartridge Respirators

No. 700 and No. 800 series—for industrial gases and vapors.

Flash!

Injuries again going

**AO's Complete Line
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will Safeguard
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New Workers and Longer
Hours Reverse Three Year
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the Injury Frequency Rate was
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Industrial accidents cost \$40 per worker in 1950*
...and accidents are rising in 1952. \$40 per worker
is a lot of money, and the National Safety Council
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much higher."

Proper safety equipment can't *prevent* all accidents
but combined with wise safety regulations which are
adhered to, it *can reduce to the vanishing point both*

the number of plant accidents and their severity.

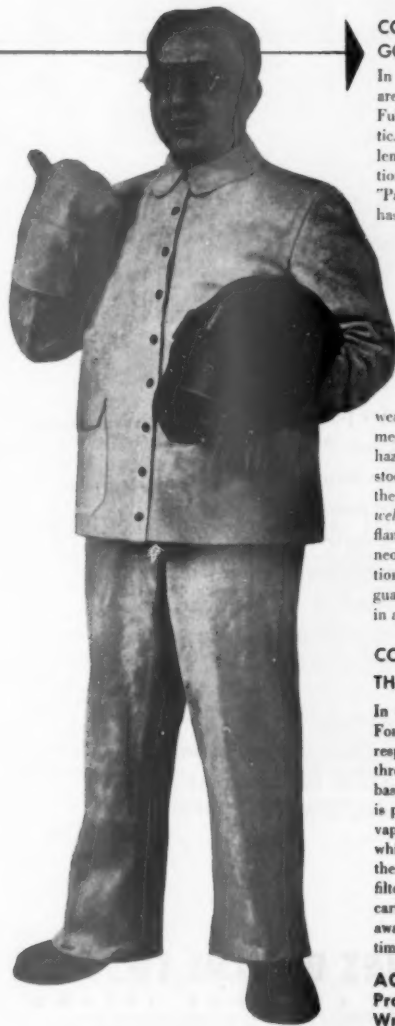
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*ACCIDENT FACTS—1951 Edition

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In the extensive line of AO Safety Goggles are over 20 products. Want a spectacle type Ful-Vue frame? AO has it — in metal or plastic. Want a hardened glass or plastic spectacle lens? AO has it. Want a goggle with exceptional wide-angle vision? AO has it in the "Panoram" and other models. Similarly, AO has the specific goggle that meets each worker's needs and preferences for welding, dust protection, foundry work, chipping, chemical operations, sand blasting — every industrial use.

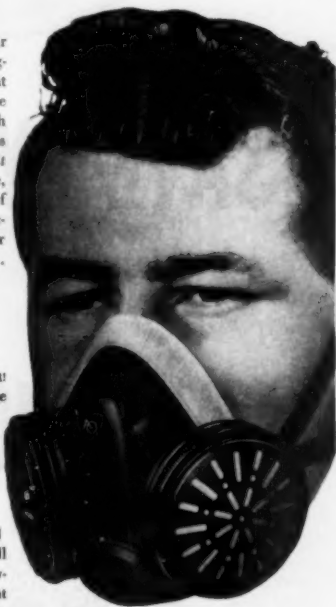
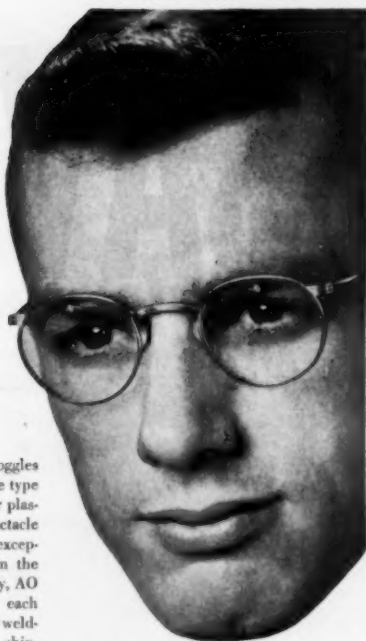
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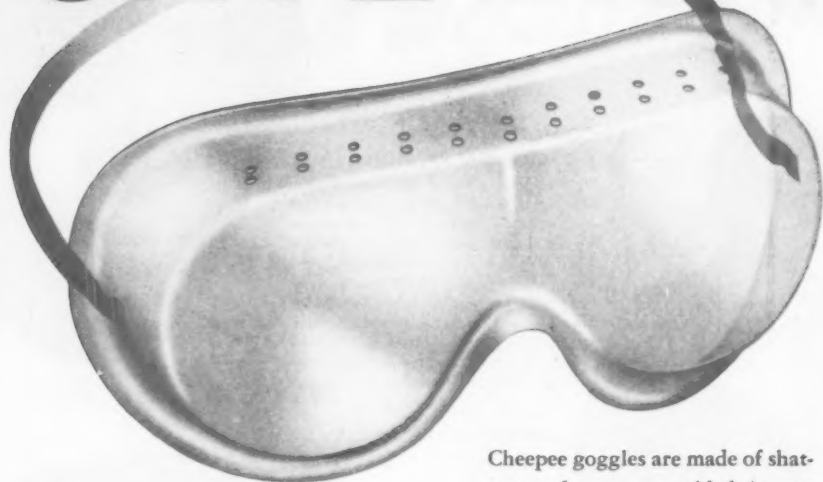
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Cheepee goggles are made of shatterproof acetate, molded in one piece to give positive, close-fitting eye protection. Plastic lens exceeds federal specifications for optical quality and resistance to breakage. Cheepee goggles are comfortable to wear, too! They weigh less than one ounce and fit over most style glasses. Available in clear or green.

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MODEL 4456 Opaque "blackout" frame and lens. Medium bridge size only. Ideal for checking furnace heat. Other models for aluminum-working, x-ray, laboratory and physical therapy work.

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Non-distorting lens; for heavy-duty, full-face protection.



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Protects costly welding filters against pitting, hot metal splatters. Will not shatter under impact.

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Shatterproof methacrylate lenses are optically correct and can be replaced instantly.

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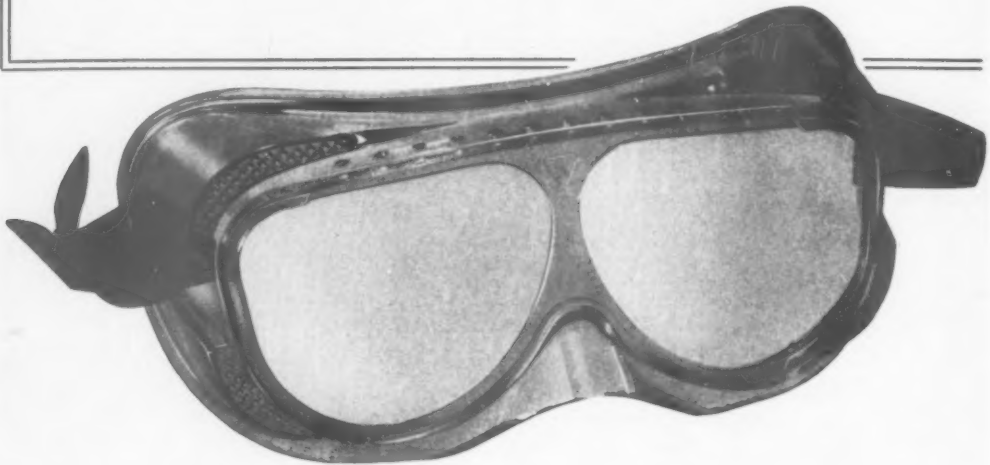


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Eye Safety Experts See New Benefits in Easy-to-Wear Styles

When a worker discards his eye protection—watch out! Chances are he suffers discomfort. You do him great service, your company and yourself great service, when you see that his safety eyewear has been designed for his comfort—as well as maximum protection. The new protective eyewear styles pictured on these pages are examples of Bausch & Lomb care in design for comfort. You can't supply anything better — at any price.



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COMFORT FOR WORKERS



Y-41 Acetate Frame

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Adjustable pads, the most comfortable construction ever devised, fit all types of nose contours. Glasses rest more lightly yet more firmly on the nose no matter how extreme the contours may be.

Z-78 with Side Shields



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NEW HALF

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SAF-CO-METER — Carbon Monoxide Indicator



WRITE FOR LITERATURE AND PRICE

SAF-I-SPEC—Low cost replaceable one-piece lens of optilite. Lens interchangeable with SAF-I-DUO

UNITED STATES SAFETY SERVICE CO.

KANSAS CITY 6, MISSOURI BRANCHES IN PRINCIPAL INDUSTRIAL CITIES

In Canada **PARMELEE, LTD.** Toronto

MILLION DOLLAR L. A. FIRE RUINS WAR GOODS PLANT

LARGE STOCKS LOST AS NEW FACTORY BURNS

Wreck For Hours: Severe Damage to New Plant

More than \$2,000,000 worth of new stocks were lost yesterday when a flame broke through the roof of the new B. F. McDonald factory at 8721 West 88th street, near Harbor.

Several of the fire were believed to have been the result of a gas leak from the factory, which was under construction at the time.

McDonald's factory at 8721 West 88th street, near Harbor.

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U.N. DEFEATS 5 RED ATTACKS IN KOREA

Britain's...

Capital...

Parley...



HEAD PROTECTION



McDonald "T" Hat offers light but rugged head protection. Famous the world over for comfort, looks, greatest safety. Two shell sizes.

RESPIRATORY PROTECTION



USBM-approved (for dust) Dustae #35 Respirator retains dust electrostatically, needs no pre-filter. 35% smaller, 25% lighter than previous models!

EYE PROTECTION



McDonald Face Shield protects eyes, face, forehead against flying sparks, metal fragments. McDonald line also includes all types of goggles, fold-back type face shields and other eye-safety equipment.

FIRST AID



Weatherproof McDonald Kanister Kit contains vital first aid supplies in handy roll-up pouch. Mounts anywhere for instant use.

SAFETY EQUIPMENT and CLOTHING



The McDonald Snake Bite Kit shown here is only one of many items of fine safety equipment and clothing manufactured by B. F. McDonald Co. Write for full information.



B. F. McDONALD COMPANY

1000 W. 10th St., Los Angeles 15, Calif. • 2121 W. 10th St., Los Angeles 15, Calif.



THE FACE THAT STA^{SAFE} PROTECTS!

He Could Be YOUR Worker!

Yes, he could even be YOU! But no matter who he is, he knows that the StaSafe face shield he's wearing is proven assurance against possibly serious injury. The wide, clear-

vision front provides full face protection against flying particles. Lightweight for comfort—sturdy for protection. There's a StaSafe face or eye shield to fit your need!

A Feature Only StaSafe Offers!!

When properly adjusted, the new StaSafe Hinged Offset headgear gives you face shield comfort plus a secure fit. The double adjustment for head contour is as simple as turning the knob on your radio.

Number 5 half-dome face shield in the off face position.



Open Hearth Shield with wool hood.



These are but a few of the many StaSafe face and eye shields available to you. Complete information is contained in the StaSafe Bulletin No. 542. Send for it NOW!

Number 9 lightweight eyeshield.



STANDARD SAFETY EQUIPMENT COMPANY

232 W. ONTARIO ST.

CHICAGO 10, ILLINOIS

The Ladies and Efficiency

—From page 6

that by recent changes, East Im-squinch mill had:

1. Increased productivity, both by man-hours and by dollar of payroll, mainly through better material handling.
2. Had reduced accidents, mainly in the categories of falls and strains and dropped objects, securing a substantial reduction in compensation insurance rates.
3. Had a lower fire insurance rate.
4. Had cut labor turnover among men.
5. Had better community relations.

Summing up, the engineer said, "If we say that point 5 has no dollar value—which is false of course—you have paid for every single frill you've put in, one way or the other. Even if you fire every gal you've hired, even if we go back to a low level of production and close down most of the expanded capacity of the plant you are money ahead."

• • •

Yes, that story's fiction, but the East Im-squinch mill isn't so much an invention as a composite of the experience of plants in almost every industry in every part of the country.

Its experience is highly relevant to the problems of industrial management in 1952, when it is as certain as anything can be that the number of women workers is going to increase in the months ahead.

WHY—

is Fendall head and eye protection equipment better?

HOW—

can you reduce costs and get the finest head and eye protection equipment ever offered?

WHEN—

can you get this better Fendall protection equipment? Must you wait, or can you get IMMEDIATE shipment?

Get your answers from Fendall before you buy another Goggle, Face Shield or other protective equipment. Write today!



FENDALL COMPANY
4631 N. Western Ave.
Chicago 25, Illinois

Keep the air you breathe
**Clean as a
Whistle...**

WITH
**COVER'S
U.S.B. of M. APPROVED
Respirators**



DUPOR no. 24

U.S.B. of M. approved for type A
dusts. 24 sq. in. twin filters.

\$300

DUPOR no. 40

U.S.B. of M. approved for type A
dusts. 40 sq. in. twin filters.

\$300



LIGHT WEIGHT • GREATER VISIBILITY • NO BLIND SPOTS • CONTROLLED BREATHING
FACE CLOTH FOR PERSONAL SANITATION • PANORAMA VIEW • EXCLUSIVE PATENTED FEATURES

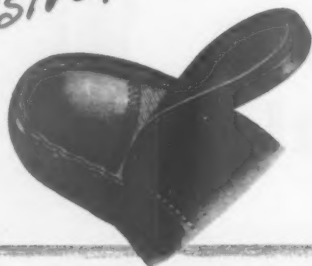
Write for full information on the complete line of DUPOR
Respirators and H. S. Cover Gas-Tight, Fog-Proof GOGGLES

H. S. COVER

SOUTH BEND, INDIANA

When there's news in safety shoes it's another Lehigh first:

Exclusive!

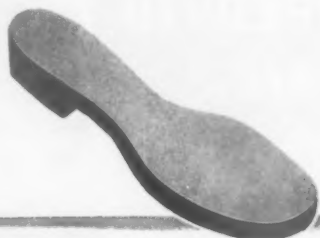


"sock-saver"

leather toe lining
**REG. U. S. PAT. OFF.
NO. 2,578,987**

ends torn socks • a common and troublesome complaint about ordinary safety shoes.

New!



"sweat-ban"

crackproof leather innersole • A special-tannage that will not crack, curl or wrinkle from dampness or perspiration for the life of the shoe. Permanently flexible.

New!



"mildew-pruf"

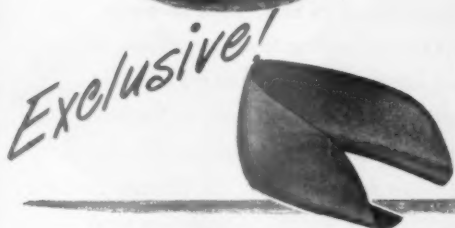
upper leather • A remarkable tannage that will not mold or mildew. Leather stays soft and pliable after repeated soakings. Presently available in retan leathers only.

see these and many other developments that set the pace in safety shoes, at **New York Safety Conference**



"parka boot"

patented cold-climate all felt safety shoe • Ideal inside arctics. Keeps feet snug in sub-zero cold. Unique "reflector" lining under steel prevents frozen toes.



"perma-counter"

patented, non-distorting heel-cup
A unique inner-reinforcement that surrounds and helps to protect the heel. Crushproof, moisture-proof, sweat-proof, keeps Lehighs in good shape longer!



"super-cushions"

with neoprene crepe soles • Today's top sport style in safety shoes: makes any job softer! Easy walking, long-wearing, impervious to oil.



Du Pont "Dacron"

polyester fiber sewing thread • One of the toughest fibers yet developed; highly resistant to acids, alkalis and heat that decompose the best previous sewing threads. Used for added strength and wear in selected Lehigh numbers.



Hotel Statler

BOOTH No. 16

April 1 to 4



In *TOE SAFETY...* it's the **INSIDE**

We concede that no safety box toe can be made regardless of its basic steel, its gauge, or its profile that can not be collapsed by unusually extreme striking force. As we see it, the job of a steel safety box toe is to reduce as far as possible the potential of the accident — to be so protective as to cause an important percentage of amputations to become fractures, and fracture cases to become abrasions, and in innumerable instances of lesser accident save the wearer from as much as a bruise. Since the best steels are already in use and since increased gauge means wearer discomfort from weight, only architectural improvement can make steel toes safer. Toes that resist back-tipping — that buttress the toe dome under extreme toe-spring — that present greater bearing surface against the shoe upper in resisting lateral spreading — may well mean the difference between minor and serious injury to the wearer. Such toes are available to your safety shoe supplier. They are known as WINGUARDS.



400

FOR SAFETY DRESS SHOES

500

FOR SAFETY WORK SHOES

story that counts



WINGUARDS

safest steel box toes

SAFETY SHOE MANUFACTURERS LICENSED TO USE WINGUARD STEEL SAFETY BOX TOES

as of Jan. 1, 1952

UNITED STATES

Allen-Squire Co.
Spencer, Mass.
G. H. Bass & Co.
Wilton, Maine
Belleville Shoe Mfg. Co.
Belleville, Illinois
Curtis Shoe Co., Inc.
Marlboro, Mass.
Charles A. Eaton Co.
Brookton, Mass.
Endicott Johnson Corp.
Endicott, N. Y.
General Shoe Corp.
Nashville, Tenn.
Georgia Shoe Mfg. Co.
Buford, Georgia
Joseph M. Herman Shoe Co.
Millis, Mass.
Will Bros. Co.
Hudson, Mass.
Holland-Racing Shoes, Inc.
Holland, Michigan
International Shoe Co.
St. Louis, Missouri
Iron Age Division
H. Childs & Co., Inc.
Pittsburgh, Penn.
Knapp Bros. Shoe Mfg. Corp.
Brookton, Mass.
Levenson Shoe Co.
Shelbyville, Wisconsin
J. F. McElwain Co.
Nashua, N. H.
Milwaukee Shoe Co.
Milwaukee, Wisconsin
Munsbach Shoe Co.
Oconomowoc, Wisconsin
A. H. Weinbrenner Co.
Milwaukee, Wisconsin
Wolverine Shoe & Tanning Corp.
Rockford, Michigan

CANADA

J. A. Biais, Inc.
St. Césaire, P. Q.
G. A. Boulet, Limited
St. Tit, P. Q.
Canada West Shoe Mfg. Co., Ltd.
Winnipeg, Manitoba
J. A. & M. Cole, Ltd.
St. Hyacinthe, P. Q.
Dowett, Lafonde, Inc.
Montreal, P. Q.
Framhamer Shoe Ltd.
Quebec City, P. Q.
The G and B Shoe Co.
Campbellford, Ont.
Grab Shoe Co., Ltd.
Kitchener, Ontario
Hydra City Shoe Mfrs. Ltd.
Kitchener, Ontario
Palmer-McLellan Shoe Co., Ltd.
Fredericton, N. B.
The T. Simson Shoe Co., Ltd.
Aurora, Ontario
The Stag Shoe Co., Ltd.
Montreal, P. Q.
Sterling Bros., Limited
London, Ontario
Tatramit Shoe Ltd.
Montreal, P. Q.
The Tillsonburg Shoe Co.
Tillsonburg, Ontario
Underhill's Limited
Barrie, Ontario
Valentine & Martin Ltd.
Kitchener, Ontario
Williams Shoe Ltd.
Brantford, Ontario

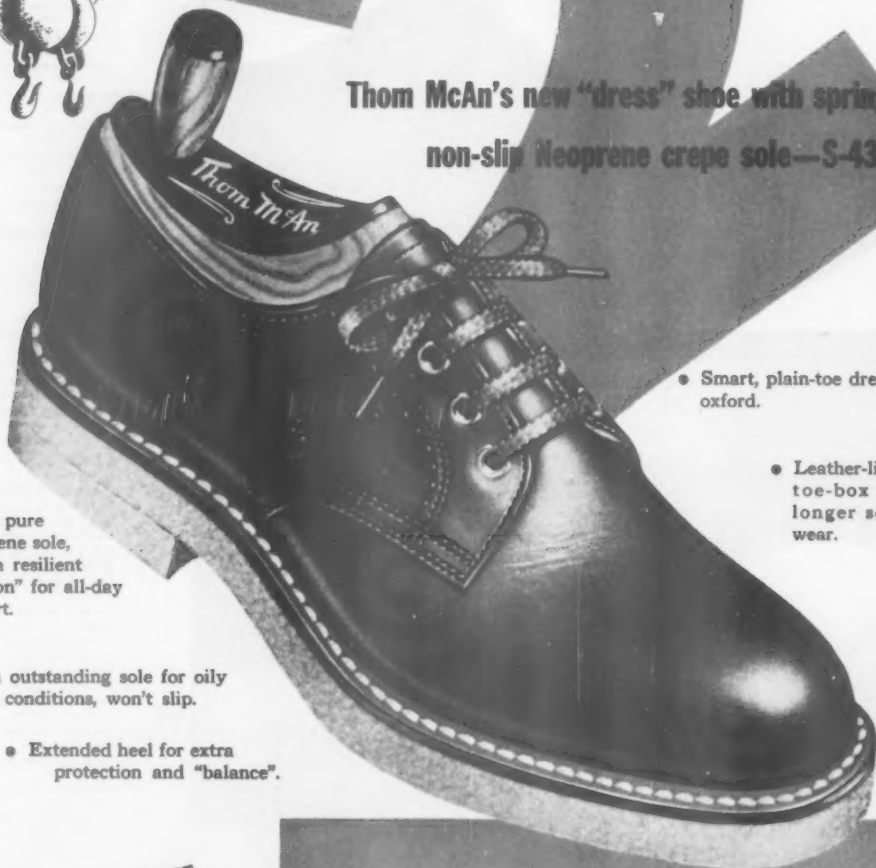
SAFETY BOX TOE COMPANY
812 Statler Office Building
Boston 16, Massachusetts

subsidiary of
Beckwith Manufacturing Company,
Dover, N. H., sales agents for the
United States. Canadian sales agents:
Beckwith Box Toe Ltd., Sherbrooke, P. Q.



GREAT NEW

Thom McAn's new "dress" shoe with springy,
non-slip Neoprene crepe sole—S-4382



- Thick, pure Neoprene sole, gives a resilient "cushion" for all-day comfort.

- An outstanding sole for oily conditions, won't slip.

- Extended heel for extra protection and "balance".

- Smart, plain-toe dress oxford.

- Leather-lined toe-box for longer sock wear.

HOW TO INTRODUCE
Thom McAn
SAFETY SHOES
TO YOUR PLANT

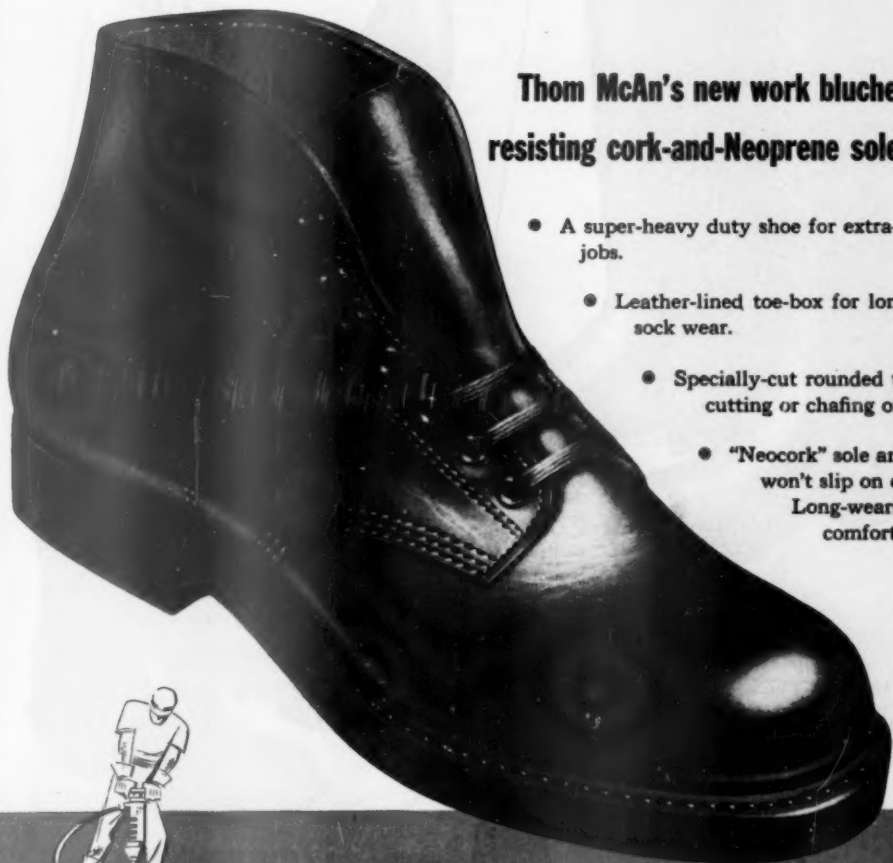
Send for our Safety Shoe booklet. Describes and pictures each safety shoe, to help you select the right models for your special needs. Study the two plans this booklet offers: 1. *Store service* through your local Thom McAn store. 2. *Plant service* where there is no local store, or where you wish to use your own department. (Note especially the section under Plan 1, entitled "Four sure ways to get workers to buy safety shoes.") Write today to:

THOM McAN SAFETY SHOE DIVISION
25 West 43rd Street, New York 18, N. Y.

SAFETY SHOES WITH NEOPRENE

Thom McAn's new work blucher with oil-resisting cork-and-Neoprene sole—S-4110

- A super-heavy duty shoe for extra-tough jobs.
- Leather-lined toe-box for longer sock wear.
- Specially-cut rounded top prevents cutting or chafing of ankle.
- "Neocork" sole and heel won't slip on oily surfaces. Long-wearing and comfortable too.



Men wear **Thom McAn** SAFETY SHOES
WILLINGLY

A DIVISION OF MELVILLE SHOE CORPORATION

Bar-Flex Soles...Steel Toes...



SHORT BOOTS—Built for heavy industry in NEOPRENE that resists oils, grease, acids. Steel Safety Toes, Bar-Flex Arch-supporting shanks, Shockproof Cushioned Insoles. Also in Tempered Rubber with cleated-type soles for general use.

HIGH KWIK ARCTICS—Tough boots for industry are all heavy-duty NEOPRENE rubber. Snug zippered closing. Two types of soles—cleated or anti-skid soles.



HOW BAR-FLEX SAVES ARCHES

See those rugged arch ridges? They put a heavy bridge right where most of your weight rests. PLUS wavy cleated sole that gives your whole foot anti-slip safety.



U. S. ROYAL SNUGLACE BOOTS—Engineered with STEEL TOES, flexible, shingled ankle construction, adjustable laced uppers. There's firm arch support in the Bar-Flex shank; safety in the non-skid soles. Shockproof Cushioned Insoles.

U N I T E D S T A T E S

Neoprene Rubber

"U. S." ENGINEERED FOR SPECIAL JOBS

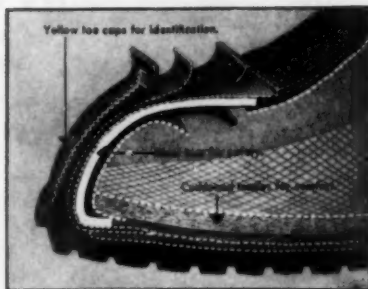
We've worked with industry for years building boots just right for your special kind of jobs.

If you stand on your feet all day, you'll find hours of arch support and comfort in the **BAR-FLEX SOLES**; cleats can't sag under your weight.

If you handle heavy loads, you'll want **STEEL TOES** for safety.

If you work with chemicals, oils, acids, "**U. S.**" **NEOPRENE RUBBER** is especially compounded to withstand their harmful effects.

These are typical of the special features that make "**U. S.**" the finest value—economical in the long run.



STEEL TOES WON'T BREAK AT 2,000 POUNDS

This tough steel arch has saved many men from injury. Its construction is engineered by "**U. S.**"



U. S. ROYAL WORK SHOES—

They're built like fine shoes—with engineered "**U. S.**" features: **STEEL TOES**, steel arch shanks and Shockproof Insoles for long hours of standing comfort. Also with plain toes. Tough Tempered Rubber.



PULL-ON WORK SHOES—Wear them over your socks, they stretch on easily and off easily... hug the ankles. Steel Toes withstand 2,000 pounds. Shockproof Cushioned Insoles and steel arch shank. Molded anti-slip soles.

LEGGIN BOOTS—They pull on over shoes and pants. The light legs roll compactly to carry. Knee or thigh lengths.



FLEXON RUBBERS—They pull on, snap snug. High cut for protection; **NEOPRENE** acid and oil resisting rubber, or tough Tempered Rubber. Anti-slip soles.

R U B B E R C O M P A N Y

ROCKEFELLER CENTER, NEW YORK



ACID PROOF



No. 7711—Reece Acid-Shoe with-stands extreme caustics. Canvas uppers impregnated with neoprene. "Perfect Rocker" Wood Sole—Light weight. Sizes—5-13. No half soles.

SHOWER SANDALS



No. 180—Platform Rocker No. 809—"Perfect Rocker" Safety Heel strap extra. Silencers extra.

- Wooden Soles Insulate
- Heat, Cold cannot Penetrate
- Nails, Glass, Scrap cannot Puncture

No. 300—The Reece "Hot Foot" sandals protect your feet in furnace and foundry rooms. Straps on over your own shoes. Heat proof wooden soles, strong galvanized iron counter, flexible hinge toe. Cannot slip. Sizes—Small, Medium, Large.

REECE ORTHOPEDIC SHOE

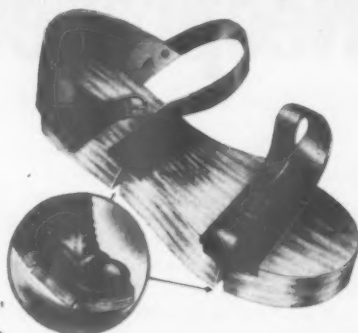
FOR BROKEN FOOT BONES, CRUSHED TOES, SWOLLEN FEET



No. x175-CG—Men's
No. x173-CG—Women's

SMOOTHLY finished WOOD SOLE with AIRFOAM insole acts as splint. Keeps injured foot immobile. Fits over bandages. Keeps a man on his feet on the job. Easily stocked. No rights—No lefts. Sizes—Small, medium, large.

AN IMPROVED "Hot Foot Sandal"



No. 351—For hot steel. Straps on quickly over any shoe. Heat proof—puncture proof. One inch thick seasoned wood. Two strong sole leather hinges. Sturdy leather counter-adjustable leather straps.

STRONG STEEL TOE



No. 504-S—Reece All-Purpose Shoe with durable leather uppers, steel toe, Reece "PERFECT ROCKER" Wooden Sole. Safe, reliable, dependable for factories, platers, oil refineries, foundries, steel mills. Also other styles. Sizes—5-13. No half sizes.

Write Today for Complete Catalog

Satin smooth selected wood soles . . . perfect fitting protection for shower and locker-rooms, full run of sizes or can be had small, medium, large.

REECE WOODEN SOLE SHOE CO.

DEPT. NS-3-52

COLUMBUS, NEBRASKA

There is no substitute for Reece Wooden Soles

VISIT OUR DISPLAY BOOTHS NOS. 77-78 AT THE 22nd ANNUAL SAFETY CONVENTION AND EXPOSITION,
HOTEL STATLER, NEW YORK



WHAT! NO CHORUS

NO! WE KNOW YOU'RE
NOT LOOKING FOR A
SHOW. BUT WE KNOW
YOU'RE LOOKING FOR
(AND HERE THEY ARE)



No. 5440
BROWN



SAFETY SHOES you can wear "TO THE SHOW" as well as "IN THE PLANT"

Presenting Our NEW STEEL SAFETY TOE

LACELESS OXFORD

STYLE • FOOT COMFORT
TOP QUALITY

like the shoes featured in leading brands
of fine shoes for men!

PROTECTION for PRODUCTION — *dressed up!*

Highly recommended for
the Industrial Worker as
well as the Executive.

- OAK BEND LEATHER SOLES WITH BROWN NEOPRENE CORK HEELS WON'T MARK FLOORS AT HOME
- TOLEX LINING REDUCES SOCK-WEAR
- FINEST GRADE ELASTIC WEB GORE ALLOWS FOR SNUG FIT



WRITE TODAY For information on complete line of Safety Shoes.



Dept. 5H, 3301 ARCH ST. • PHILADELPHIA 4, PA.

Meet the group

WHO KNOW SAFETY



Fourteen good reasons why **Iron Age** is the . . .

Here are fourteen Iron Age representatives—good people who are good friends to hundreds responsible for employee safety all over the country. *They know their safety shoes.* And they know how to tailor and install safety shoe programs to meet any individual plant requirement. They are trained and experienced, of course. But most important they handle the complete line of Iron Age Safety Shoes, the style and value leaders in the industry. Any in this group will give you friendly service and straight-from-the-shoulder answers to your questions about safety shoe programs. Call upon their knowledge—they are eager to serve.



Iron Age SAFETY SHOES

SHOES BEST!



GRACE R. CHRISTIE
Buffalo, N.Y.



ROBERT D. BURNS
Boston, Mass.



CHARLES GARMANN
Pittsburgh, Pa.



HARVEY CHILDS, JR.
Dallas, Texas



No. 625



No. 614



No. 683



No. 698

fastest growing line

**4 IRON AGE
VALUE LEADERS**

Pictured are four of the more popular Iron Age styles, representative of the eye appeal, comfort and value that run through the entire line. Just write and ask us to have the Iron Age representative in your locality survey your operations without obligation. He will be glad to recommend the stock shoes that will best suit your needs; the styles that will sell best to your employees.

Iron Age Division, H. Childs & Co., Inc.
1205 MADISON AVENUE
PITTSBURGH 12, PA.

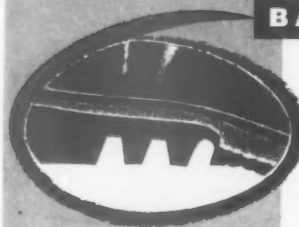
3

REASONS WHY

TOP NOTCH

FOOTWEAR IS BEST!

BAR-FLEX

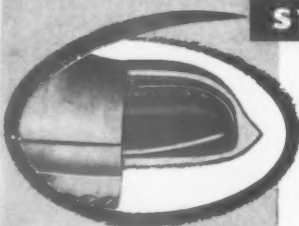


Patented outside arch and heel that adds to comfort and gives better traction.

Neoprene Oilace Boot shown is available with or without Bar-Flex feature. Neoprene—a special compound that resists oil, grease and acids. Also available, a short black industrial boot with DURATEST Bar-Flex outsole.



STEELTOE

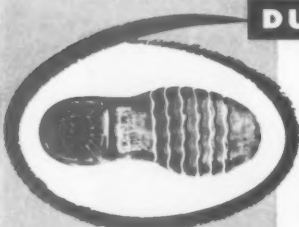


Tested to withstand 2000 lbs. pressure! Here is genuine tested protection against toe injuries—the most common foot hazard to a worker!

Werkin—6" all rubber work shoe with appearance of a leather shoe, DURATEST non-skid outsole, cushion insole. Steeltoe or plain. Also, a new Pullon work shoe, of similar construction.



DURATEST



A new "tougher" rubber compound that gives better resistance to abrasion resulting in longer wear. Tested for extra quality and durability—DURATEST.

Red Buddy Monkate—Work rubber with stretchy uppers and special design DURATEST outsole. Available in black. Also, red or black 2 buckle styles, regular or logger heels, and black storm or hicut pattern with gray outsoles.



BEACON FALLS RUBBER FOOTWEAR
BEACON FALLS, CONNECTICUT

Leg Protection

PROTECTION for the legs is required in certain industries against the hazards of hot materials, corrosive substances, blows from sharp tools or heavy objects, and bites of poisonous snakes.

Protective garments vary from waist-length leggings to spats. For



Leggings and spats of leather and asbestos for protection against molten metal and sparks.

some occupations the extra protection of the longer types is desirable.

Materials commonly used are:

1. Asbestos for protection against molten metal, severe heat and heavy sparks.
2. Chrome-tanned leather for less severe exposure to splashes and sparks.
3. Fire-resistant duck to ward off light splashes and sparks.
4. Rubber, neoprene and plastic for work with acids, alkalis and hot water.
5. Lightweight alloys or fiber for protection against blows from axes, adzes, and heavy objects.

Men who work with molten metal use leggings designed to be removed instantly in an emergency. The leggings should have flares to protect the instep, and should be free from projecting buckles and clasps.

Chrome leather, when new, is less resistant to hot metal splashes and sparks. With use it acquires a tougher surface. It has been recommended that the operator keep out of the line of fire as much as possible until the garment has been broken in.

Poisonous snakes are a hazard in some regions. Construction, petroleum, public utility and farm workers are among those most exposed. Bites are invariably below the knee and high boots are frequently worn. More effective protection is provided by fiber leggings. Coverings of water-proofed duck protect the leggings against long wet grass.

Knee pads are worn on jobs which require continuous kneeling.



workmen almost can be ^{as} **SUREFOOTED** as a fly

The four soles, shown below, are designed to perform one major function, namely, **GIVE WORKMEN BETTER FOOTING!** And they DO just that. Proof of this is the enthusiasm of both labor and management in plants where shoes with these soles are being worn. Accidents, due to slipping and falling, have been greatly reduced. This means greater profits for your company. Shoes with these soles can be supplied by nearly every work shoe manufacturer.

Mr. SAFETY ENGINEER

Will you assist in a safety program that will benefit the workmen in your plant? Just let us know of any condition that is wrecking shoe soles or where footing is hazardous. We will cooperate with you, at no cost to your company, in determining what type of sole will afford the greatest safety and the most wear.



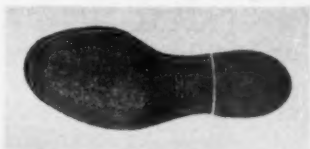
NEO-CORD

A fine cord and neoprene sole that is resistant to oil, grease, gasoline, acids, caustics and heat. Cord construction gives NEO-CORDS a high non-slip efficiency for the life of the sole.



NEO-CORK

An outstanding cork and neoprene sole that gives long non-slip wear. NEO-CORKS resist gasoline, oil, grease, acids and caustics. They won't pick up metal chips, are waterproof and cushion the feet.



GRO-CORK

The top cork and rubber sole. It's light, slip-resistant, won't pick up metal chips, and waterproof. Feet are cushioned and protected from heat or cold. GRO-CORKS are not resistant to grease, oil or gasoline.



GRO-CORD

This remarkable sole, with its cord-on-end construction, affords non-slip footing and extra long wear. GRO-CORD soles should not be worn where grease, oil or gasoline saturates the footing.

GRO-CORD RUBBER CO.

LIMA, OHIO

Canadian Post

GRO-CORD RUBBER CO.
of CANADA LTD.
Tillsonburg, Ontario

Cut Safety Shoe Costs

with **HY-TEST'S**
exclusive **BolTan** leather insoles

Perpiration is mighty
hard on ordinary insoles.
Sweat resistant Bol Tan insoles
assure up to twice the
wear per pair.



W113—Men's Brown
Sole wearing shoe type
leather oxford.

W172—Men's Black Ozone shoe
type leather, leather top shoe.
Black and white composite
material, sole, heel.

... Insure Workers' Feet in Sure Protection



THE WORLD'S LARGEST SELLING SAFETY SHOE
HY-TEST DIV. INTERNATIONAL SHOE COMPANY • SAINT LOUIS 3, MISSOURI

...in addition to cutting
Safety Shoe Costs HY-TEST'S
 exclusive **Bol Tan** leather insoles...

1. Are extremely flexible and comfortable
2. Are sweat resistant
3. Stay soft and pliable throughout the longer life of the shoe
4. Will not curl, crack or dry out because of perspiration
5. Cost no more



HY-TEST's ventilated
 brown hide 12-wing
 leather oxford

No other
 Safety Shoes feature
Bol Tan, a Hy-Test
 exclusive, developed,
 proved and produced
 by International
 Shoe
 Company.

Use this handy order
 blank to obtain details
 on Hy-Test's Bol Tan
 leather insoles.

HY-TEST
SAFETY SHOES



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Please send me free copy of your
 folder explaining the advantages
 of Bol Tan leather insoles:

Send to: _____

Signed _____



Style No. 902—\$6.35
Chrome Leather Sole

Style No. 802—\$5.95
Heavy Black Rubber Sole

(Prices subject to change
without notice.)

Army Retan Upper.
Nailed construction.
STEEL safety box toe.



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Style No. 200—\$5.20
Heavy Composition Sole

Army Retan Upper.
Nailed construction.
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In Stock for Immediate Shipment

In Goodyear Welt Construction All Styles 75 Cents Higher

HARRY J. WOLF SHOE CO., SHEBOYGAN, WISCONSIN

Pioneers of Safety Footwear Development

SKIDMASTER

**NON-SKID
ON SLICK SURFACES
NO DISCOMFORT
ON HOT, COLD OR WET FLOORS**

SKIDMASTERS are non-skid sandals worn over the shoe to assure traction on slick surfaces and insulate the feet against the discomfort of working on hot, cold or wet floors. Made of new synthetic rubber belting, SKIDMASTERS stand up under rough usage. Steel mills, shops, laundries, dairies, cold storage houses—hundreds of industrial users find them practical insurance against hazardous floor conditions. Promote plant safety and greater working comfort by standardizing on SKIDMASTERS.



Write for Descriptive Bulletin No. 217

STANDARD SAFETY EQUIPMENT COMPANY

232 West Ontario Street, Chicago 10, Illinois

REFERENCES

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JOB-TESTED

IN THE WORLD'S TOUGHEST LABORATORY

... on the feet of America's workers

Make your own tests. See why industry turns to Vul-Cork and Vul-Cork Neoprene soles to help reduce accidents and keep workers comfortable.

Vul-Cork does everything you ask of a safety shoe sole, in nearly all kinds of jobs. It is also proving exceptionally durable and comfortable on abrasive surfaces which wear out ordinary soles — surfaces such as cinders, sand and cement floors.

When the shoes your workers wear must also resist oil, grease, acids and heat, then Vul-Cork Neoprene is your answer. You may not expect an oil-resistant sole to be light and flexible too, but Vul-Cork Neoprene is.

Write and tell us how many sample soles you want, and the sizes needed. We will also send you the names of the top-quality safety shoe manufacturers who use Vul-Cork and Vul-Cork Neoprene soles.

Vul-Cork Soles won't leave marks on floors when your workers arrive home. Their clean, firm edges give a dress-shoe appearance that workers appreciate.

Vul-Cork

AND VUL-CORK NEOPRENE

THE Cambridge

RUBBER
COMPANY

VUL-CORK DIVISION, TANEYTOWN, MARYLAND





Another
JACKSON
First!

New WELDING HELMET

with Outstanding New Features

Completely New Type of Helmet. The one-piece helmet shell is high-compression molded of laminated fabric, phenolic impregnated. This thermosetting material, by being more resistant to high heat and much less moisture absorbent, will hold its shape and weight far better than the ordinary vulcanized fibre. Its tough surface withstands weld spatter. It has been tested at 3000 volts against electrical conductivity. It is strong, smooth, easy to clean, and far more attractive in appearance.

New Lens Holder. The cover glass slides out from the front of the helmet, without disturbing the filter lens. There are no gaskets or other parts to come loose. Inner and outer metal lens frames are press-fitted and riveted to the shell. Both lens and



One-piece molded plastic shell swings on adjustable friction pivots



To replace, cover glass slides out without disturbing the filter lens

cover glass are held securely but flexibly by steel springs. The filter lens is replaced from the inside, also without the use of tools.

Before shipment, all helmets are checked for light leakage against high powered light.

Headgear is of smooth plastic, easy to wash and sterilize. It is quickly adjusted (and then held firmly) to any head size. Oval in shape, it follows the natural outline of the head. A cork-padded sweatband, inexpensive to replace, is held by snap buttons. The shell is hinged from the sides of the headgear on manually adjustable friction pivots which allow easy raising and lowering, yet their concealed springs hold the helmet in any desired position.

JACKSON
PRODUCTS
WARREN • MICHIGAN

sold World-Wide . . .
through Distributors
and Dealers

(Advertisement)

New Safety Hats Keep Workers Safe, Happy

Lightest weight, most resilient molded safety hats yet developed are the Hard Boiled Hats and Caps made of impregnated Fiberglas. Little publicized is the cap pictured—developed especially for mines, but also widely used by steel erectors.



Molded "glass" crowns are available in either hat or cap styles to meet the needs and specifications of all industries. In addition to passing by a wide margin standard tests for resistance to impact, moisture and electrical shock, the material will not support a flame, and in radiation tests proved to be 10% cooler to wear.

Unlimited choice of solid, permanent molded colors is available—with many colors available at no extra cost.



Ribbed Crown Adds Strength

New, also, is the aircraft grade aluminum alloy Hard Boiled Hat, which passes standard drop tests, and is safe to wear except where electrical shock is a hazard.

All models feature interchangeable, quick-change, hammock-headband assemblies that are universally sized, to cut user inventories.

For other details, write E. D. Bullard Company, 275 Eighth St., San Francisco 3, California. Distributors in principal cities.

(Advertisement)

National Safety News, March, 1952

For Greatest Comfort and Efficiency BULLARD Protective Hoods and Air Purifying Equipment

B-1 Air Line Hood

Provides a fresh atmosphere to work in. Made of featherweight, translucent, easy-to-clean Vinylite for comfort and freedom of body movement. Full-vision, non-fogging facepiece. Protection against nuisance dusts and annoying fumes. State of California Division of Industrial Safety approved.

BULLARD EVERYTHING IN SAFETY • BULLARD



Respirator Dust Hood

No interference with normal breathing. Large filter area admits plenty of air while keeping out dust and fumes. Featherweight hood is made of easily cleaned, translucent Vinylite. Quick change filters and wide vision shield. Two types: for metal fumes—for nuisance dusts. U.S.B.M. approved.

BULLARD EVERYTHING IN SAFETY • BULLARD



Acid Hood

Guards worker against all splashing liquids. Made of high-resistance Vinylite—tough, featherweight, translucent for comfort and wearability. Extra eye protection by snug-fitting, acid-proof, rubber frame goggles with non-shattering laminated lenses. Efficient coverage of head, shoulders, and chest.

"Everything in Safety" for Industry

Makers of the famous Hard Boiled Hat. First Aid Kits and supplies; Respirators, Canister and Hose Masks; Safety Belts and Clothing.

E. D. Bullard Company

275 Eighth St., San Francisco 3, Calif.

Distributors in Principal Cities

EVERYTHING IN SAFETY



EVERYTHING IN SAFETY



Blasting Helmet

Full safety from injurious dusts, sand, or shot with maximum comfort. Outer hood of Neoprene impregnated Fibreglas. Zippered inner cape permits quick removal. Built-in head protection, ample headroom, no-draft air feed, full-vision facepiece.

EVERYTHING IN SAFETY



Compressed Air Purifiers

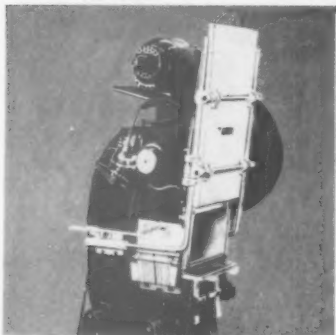
Supply clean air to helmet and hood wearers to guard health and comfort. Protect air-driven equipment and spray guns from wear and corrosion. High efficiency air filtering cuts rejects on all spray operations. 3 sizes—capacities: 10 to 150 cubic feet per minute of free air.

EVERYTHING IN SAFETY

EVERYTHING
BULLARD
IN SAFETY



*3 products that make work safer—
easier and help you boost production*



THE ALLSAFE AIRGARD FOR PUNCH PRESSES

The only really safe type of guard for a punch press with a positive clutch is one which places a barrier between hands of operator and point of operation . . . PLUS . . . one that provides complete protection against repeat strokes. The Allsafe AIRGARD is the only guard that does this on all types of work.

AIRGARD protects everybody—operator, die setter and meddler. AIRGARD permits all operations—forming, blanking, strip blanking and work held in hand. AIRGARD fits every type of press—is quickly and easily installed.

Write for 8 page AIRGARD catalog today!



DRYBROW — THE NATION'S SWEATBAND

Drybrow is not to be confused with ordinary throw-away bands. Lasts for months.

Industry is using millions of DRYBROWS annually to take the "lag" out of hot temperature production. Exclusive patented features make DRYBROW the sweat band preferred by workers coast to coast.

Only a sweatband made of cellulose sponge such as DRYBROW gives a cooling effect to forehead due to evaporation. Exclusive DRYBROW features: 1. Sponge is reinforced for longer life. 2. Free floating, self-adjusting headband eliminates strain on sponge.

FREE Sample DRYBROW sent on request—no obligation!



ALLSAFE INDUSTRIAL WOOL COAT

(One item from the Allsafe line of safety clothing which includes flame proof duck, leggings, spats, jackets, trousers, etc.)

Allsafe wool coats provide first rate protection wherever sparks and molten metal fly. Made of top quality 32 ounce fabric (material in most coats only 22 or 23 ounce) 100% wool in content, it is flame resistant. Special features include: upright double thick collar, inseam sewing at shoulders, reinforced sleeves, one piece back construction, and all edges hemmed.

Available in any length and any body size. Standard lengths 44" and 48".

Sample swatch of cloth and literature sent on request!

AMERICAN ALLSAFE COMPANY INC.

1245 NIAGARA STREET • BUFFALO 13, NEW YORK



Safety Clothing

SAFE CLOTHING may be any type of clothing that is clean, in good repair and suitable for the job. Most garments offer some protection against minor hazards.

Safety clothing refers to specific garments designed for certain hazardous jobs where ordinary work clothes do not provide sufficient protection.

Proper fitting is essential in all work clothing. Long, loose sleeves and neckties may get caught in machinery. Trouser cuffs may cause tripping.

Clothing soaked in oil or solvent is ignited easily and may cause skin irritation. Cleanliness is also an important aid to morale.

Some companies furnish laundered overalls, coveralls, aprons, smocks, and other garments in occupations where extreme cleanliness is necessary because of the product or because of health-hazardous processes.

Exposures that require special protective garments include moisture, high temperatures, hot or corrosive substances, flying particles, sharp or rough edges, etc. (See chart on page 3 for types of garments and materials for various hazards.)

—To page 116

How to Order Welding Plates

You want easy density inspection, protection against breakage, an extra plate in your pocket if away from the plant. That means Sellstrom Welding Plates individually packed in inspection packages, each plate comprising the Welding Plate, a gasket and the cover plate. All plates graded to densities 2 to 16.

You also want Welding Plates exactly suited to your requirements. That again means Sellstrom Welding Plates in the following variety:

"**Sel-300**"—Super quality. Meets all Federal Specifications. Made from optical blanks. As near perfect as humanly possible.

"**Excelolite**"—Meets all commercial needs. Carefully graded.

"**Two-Piece Excelolite**"—Same as Excelolite, two pieces 2"x2½", carefully matched, make one complete 2"x4½" plate.

"**Tufweld**"—A piece of clear plastic firmly pressed between two welding plates to make a single unit. Can temporarily be used even after one piece is cracked.

"**Sel-Blue**"—Brings out white portion of flame.

"**Cobalt-Blue**"—Brings out red portion of flame.

"**Green Glass**"—Recommended where only small amount of Infra Red is encountered.

"**Ruby Glass**"—Recommended where red color helps to determine the outline of the work.

"**Sel-Safe Laminated**"—Piece of clear plastic laminated between two thin pieces of glass to make a complete welding plate.

"**Sel-Hard**"—Hardened to meet severe blows. Meets drop ball specifications.

Cover Plates—Available in large variety from 3c to 35c each.

Sellstrom Goggle Welding Lenses available for every possible use. Industrial Goggle Lenses to supply your every need. Order them from your dealer or write us direct.

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MANUFACTURING COMPANY

Let Sellstrom Safeguard Your Eyes and Face
622 North Aberdeen Street Chicago 22, Ill.



"MODERN"

APPROVED PROTECTION FOR EYES, HEAD AND HANDS

SAFE-T-SITE Cup and Overspec Goggles for Welders, Chippers and Grinders. Patented improved method of ventilation. Extra safe, durable and form-fitting.

SAFE-T-SITE Frontal and All Around Protective Spectacles with or without sideshields. Safe, comfortable and attractive.

SAFE-T-GRIP Acetate Spectacles. Attractive in appearance. Fitted with drop eye thermally curved lens. Patented comfort-fit flexible temples. Feather light in weight to give wearer extra comfort.

SAFE-T-WELD Filter Plates and Lenses are carefully checked for quality and scientifically tested to conform with Fed. Spec. requirements.

SAFE-T-HARD SUPER TEMPERED Lenses made of clear ground and polished glass are heat treated and hardened to meet Fed. Spec. requirements.

FOR EXTRA EFFICIENCY AND PROTECTION

RAYFLEX SAFE-T-WELD Filter Plates and Lenses

COBALT BLUE SAFE-T-WELD Filter Plates and Lenses

RAYFLEX COBALT BLUE SAFE-T-WELD Filter Plates and Lenses

FOR DUAL PURPOSE REQUIREMENTS

DEMI-COLOR SAFE-T-WELD Filter Lenses

½ Clear—½ **SAFE-T-WELD**

½ Clear—½ **RAYFLEX SAFE-T-WELD**

½ Clear—½ **COBALT BLUE SAFE-T-WELD**

½ Clear—½ **RAYFLEX COBALT BLUE SAFE-T-WELD**

Our catalog features safety items other than those specified above. Please write for free copy.

MODERN GLASS PROCESSING CORPORATION

1545 SCHAEFFER STREET

BROOKLYN 27, N. Y.

Safe-T-Site Cup Goggle



Safe-T-Site Overspec Goggle



Safe-T-Site Spectacle



Safe-T-Grip Spectacle



1898-1933
TANNERS OF
QUALITY LEATHERS

LICHTMAN
J.L.&S.
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MADE IN U.S.A.
J. LICHTMAN & SONS

**For Best Results
INSIST ON
LICHTMAN
Heat Resistant
LEATHER
For Protective Clothing**

Before the HEAT HITS!



STOCK UP

ON

STASAFE

KOOLPADS



WHY? Because Koolpads will save you time and money when the heat hits your worker production . . . In hot weather, it takes a worker at least one minute to clear the sweat streaks from his eye

glasses or safety goggles. If he does this twenty times a day, it costs you twenty minutes of non-production. Multiply this twenty minute loss times the number of workers you have wearing safety glasses or goggles. It really adds up at today's high cost of labor! . . . KOOLPADS can save you most of this trouble . . .

HOW? These featherweight, low cost, cellulose sponge sweatbands absorb sweat — keep safety glasses and goggles clear from streaks and fog. With no loss of time — Workers SEE BETTER, FEEL BETTER, WORK BETTER. Production stays up. You profit!

STANDARD MODEL

with elastic headband

WELDERS MODEL

with snaps

Order a Quantity Now . . . Before the Heat Hits!

For More Information, Ask For Bulletin 536 and Prices

STANDARD SAFETY EQUIPMENT COMPANY

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DAVID'S WELDERS GLOVES GIVE TRUE HAND PROTECTION

Here is a Welder's Glove which has been thoroughly factory tested and proven! Made of fine, always-soft, pearl-split horsehide, it has a seamless welded using thumb. Gunn cut style.

BUILT FOR SERVICE, COMFORT AND SAFETY

ONLY

\$18.00

DOZ.

ORDER BY

LOT No. 565

Write for our new, illustrated catalogue listing over 1,000 glove styles! A glove for every job . . . for every man, woman and child. See why David's is the Goliath of the work glove industry.

WRITE DIRECT TO

DAVID'S GLOVES

DEPT. W.S.
SPRINGFIELD, OHIO

The following are essential in all types of work clothes:

1. Adequate protection.
2. Comfort and freedom of movement.
3. Durability.
4. Appearance.

Appearance of clothing is particularly important with women employees but men are not indifferent to it.

Standards. Specifications established by the Federal Government have provided widely used standards for many years. During the war the American Standards Association approved a series of "War Standards for Protective Occupational Clothing—Series L18." These are to form the basis of permanent standards.

These specifications cover protection against sparks, molten metal, infra-red and ultra-violet rays, and limited impact forces. Details of pattern, design, workmanship and range of sizes are also included.

Protective Materials

Asbestos is the preferred material for protection against intense heat, and flame. Many garments are made of this material, including complete suits for fire-fighting and rescue work.

Airplane crash fires have focused attention on more effective protection for fire-fighters and rescue crews. These suits use not only insulating material against conductive heat but also a radiation barrier of reflective material, such as aluminum foil. Suits of this type have been developed by the U. S. Air Force.

Wool clothing should be worn under asbestos garments where intense heat is encountered.

Leather of various grades is used for protective garments. Chrometanned leather affords protection from sparks, molten metal splashes, and infra-red and ultra-violet rays. Leather, however, deteriorates under continued exposure to heat. For severe exposure, asbestos should be used.

Leather provides protection against limited impact. Padded leather or fabric aprons and hard fiber or metal protectors for the abdomen absorb much of the force of hard blows.

Leather reinforced by metal stitching or wire staples is resistant to cuts and abrasion.

Impervious materials of many types provide protection against dust, vapors, mists, moisture and corrosive liquids. They are useful in handling materials which would cause dermatitis or burns. This type of material includes rubber, neoprene and vinyl films and fabric coated with them.

Rubber is widely used because it resists acids, caustics and other corrosive substances. Garments of rubberized fabric are used when handling low concentrations of acids and non-caustic liquids and for pro-

tection against weather. Rubber's high dielectric strength makes it useful for protective equipment where electricity is used.

Neoprene has numerous applications in safety equipment. It forms a tough, durable film resistant to oils, solvents, acids and alkalis. It has high dielectric strength.

Flame-resistant duck, a light-weight fabric, is quite strong and will outwear ordinary material used in work clothes. For protection against extreme heat, asbestos should be used.

Water-resistant duck is recommended in exposures to water and non-corrosive liquids. It combines strength and durability with light weight.

Vinyl plastic has many uses in safety equipment. For some garments the plastic is rolled or calendered onto fabric. For others the strong pliable film is used without backing.

Synthetic fabrics, such as dynel, orlon and vinyon, are used for durable work clothing. These fabrics resist acids, caustics, mildew and tearing. They stand up well under repeated laundering.

Aluminized duck and drill are used for garments where radiated heat is a problem.

Flameproofing for cotton garments is desirable in some occupations. Newer flameproofing materials withstand repeated launderings.

Welder's Clothing

Protective clothing is as much a part of the arc welder's equipment as the helmet and goggles. Cotton shirts and dungarees worn in warm weather can be ignited quite easily and the protection of chrome-tanned leather may avoid serious burns and loss of valuable time.

Welders' leather garments include overalls, pants, chaps, aprons, jackets, sleeves, gloves, mittens and spats.

Garments should be of good quality leather, solidly constructed. Fastenings must prevent gaping and should be so designed that the wearer can get out of the garment quickly. There should be no turned-up cuffs or other projections to catch hot metal. Pockets should be equipped with flaps.

Transparent Tarpaulins

Tarpaulins of vinylite plastic sheeting have proved useful in many industries. The tarpaulins are waterproof and non-conductors of electricity and allow passage of enough light for easy visibility of work to be done. Telephone companies use these plastic sheets for the protection of linemen's repair work. They are also used for covering boats and trucks and for many specialized uses.

UNIGOGGLE type WR-60 has adjustable elastic headband



UNIGOGGLE type W-60 has plastic headrest, and telescopic arm



Unigoggle

A One-Cup Headrest Goggle made expressly for Gas Welding, Flame Cutting and Brazing

It's lighter, cooler, easier to wear. One-piece molded plastic fits lightly, yet firmly, against face, excluding light and heat, may be worn over regular glasses. Lens, shades 3 through 6, standard 2 by 4 1/4", is protected by cover glass; no tools are needed for replacement. Adjustable Headrest is easy to wash or sterilize. A cork padded sweatband adds comfort.

OTHER JACKSONS SHOWN HERE:

For Gas Welding, Cutting and Brazing, with lenses in F.S. shades 3 thru 6; types W-50, LTB-50 and BX with headrests, type WR-50 with elastic band.

For Chipping and Grinding, with clear, hardened lenses: type G-50 with headrest, type GR-50 with elastic band.

For Flash Welding and Metal Pouring, with visors in light, medium and dark green, .020" thick, 4", 6", and 8" deep: type J-1 shield with headrest, type C shield with elastic band in back.

For Resistance Welding, Metal Finishing, Woodworking, etc., with visors of clear plastic .020", .030", and .040" thick, 4", 6", and 8" deep: type J-1 shield with headrest, type C shield with elastic band in back.

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sold World-Wide... through Distributors and Dealers

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LEADING MANUFACTURER OF SAFETY GARMENTS

HOLCOMB PROTECTION

PRODUCTS INCLUDE

GLOVES
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HOLCOMB SAFETY GARMENT CO.

118 North Jefferson Street

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PLASTIGLAS-HEDGARD



NOW...A Smart Looking Safety Hat...

"Your Men Will Want to Wear!"

Lighter than conventional hats . . . yet as strong as metal . . . giving the wearer protection against falling objects, electric shock, dripping fluids. The new Davis Plastiglas-Hedgards have the protection features essential in safety headgear . . . plus style and comfort that make them "the hat your men will want to wear."

It's the safety hat that has long been needed in industry, wherever head injuries are a hazard. Available in aluminum or brown finishes . . . or your choice of colors.

Model E
(Hat) brim



Model F
(Cap) no brim—peak only

Check These Features

- | | |
|----------------------------------|---|
| STRENGTH | Will exceed impact of 40 ft. lbs. |
| INSULATION | High dielectric properties give protection against shock. |
| RESILIENT | Does not crack or break if dropped. |
| RAIN PROTECTION | Broad back brim on Model E gives added protection against sun and rain. |
| UNIVERSAL CRADLE | One hat fits all head sizes, shapes, reduces your inventory. |
| SHOCK ABSORBER SUSPENSION | Under pressure of heavy blow, crown and suspension reduce the shock by "giving" slightly. Cradle spreads shock of a blow on side of head. |
| COOL | Air circulation between cradle and crown keeps hat cool under hot sun. |
| MOISTURE PROOF | Immune to effects of rain, dampness. |



Write for prices. Or order one to see for yourself how completely the new Davis Plastiglas Hedgards answer your safety hat problems.



Davis Emergency Equipment Co., Inc.
55 Halleck St., Newark, N. J.

Safety Suggestion: Tear Out and File for Ready Reference

Scott Air-Pak Safety Breathing Equipment is sold by:

ALBANY, NEW YORK—Kiddo Lux Products Co.
ATLANTA, GEORGIA—Southwestern Safety Appliance Co.
BILLINGS, MONTANA—Big Horn Supply Co.
BIRMINGHAM, ALABAMA—Safety Engrs. & Supply Co.
BOSTON, MASS.—American Fire Equipment Corp.
BUFFALO, NEW YORK—American Alliance Co.
CHARLESTON, W. VA.—Safe's First Supply Co.
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CINCINNATI, OHIO—Southern Supply Co.
CLEVELAND, OHIO—Safety First Supply Co.
COLUMBUS, OHIO—W. E. Brantner Co.
DAYTON, OHIO—The Dayton Safety Supply Co.
DENVER, COLORADO—"Mac" Galley Equipment Co.
DETROIT, MICH.—National Safety Prod. & Service Co.
DULUTH, MINNESOTA—W. P. & R. S. Mars Co.
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HAMDEN, CONNECTICUT—O. B. Maxwell Co.
HONOLULU, HAWAII—Hawaiian Gas Products, Ltd.
HOUSTON, TEXAS—Allied Safety Equipment, Inc.
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KANSAS CITY, MISSOURI—Safety, Incorporated
KINGSFORD, TENNESSEE—Southern Oxygen Co.
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LOUISVILLE, KENTUCKY—Orr Safety Equipment Co.
MARINETTE, WISCONSIN—Queen City Supply Co.
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OMAHA, NEBRASKA—Anderson Fire Equipment Co.
PHILADELPHIA, PA.—Guardian Safety Equipment Co.
PHOENIX, ARIZONA—Thunderbird Sales Corp.
PITTSBURGH, PA.—Safety First Supply Co.
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**The safe, low cost
way to deal with
ANY Breathing
Hazard —**

Scott Air-Pak

Reduce shutdown time, lower maintenance costs with greater safety to personnel — by placing Scott Air-Pak Self-Contained Breathing Equipment in your plant.

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Scott Air-Pak delivers cool, confidence-inspiring air (not oxygen), eliminating unnecessary hazards—especially in the presence of petroleum vapors.

Low operating cost; used by hundreds of industrial plants to give comfortable, complete protection for routine inspection or emergency work in toxic atmospheres.

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In first-aid room or "on the spot" oxygen can be given safely and economically, with the Scott Demand Inhalator. Low-cost oxygen unit featuring "demand" principle, with constant flow available

"at the touch of a button." Lowest breathing resistance of any oxygen breathing equipment. Easy to use — no adjustments of any kind. No special training needed.



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SEE THE SCOTT AIR-PAK AND SCOTT DEMAND INHALATOR ON DISPLAY AT THE GREATER NEW YORK SAFETY SHOW, APRIL 1-4—BOOTHS No. 47 & 48, HOTEL STATLER, NEW YORK, AND AT THE WESTERN PENNSYLVANIA SAFETY CONFERENCE AND EXHIBIT, HOTEL WILLIAM PENN, PITTSBURGH, PA., APRIL 15-17, BOOTH No. 17.



WINDSOCK! WINTERIZE YOUR SAFETY HAT

WINDSOCK is an expendable, lightweight, throw-away type head covering designed for winter wear under safety hats.

Warmth in the winter and head protection against drafts are inherent features of this health protector.

Order Now— 9" length \$2.64 a doz.
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—Before those cold breezes start circulating up under your safety hat and over your bare head.

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LOOK FOR



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ASBESTOS GLOVES for HEAT HAZARDS



No. 164



No. 174



No. 1744

These three numbers are part of the complete line of GARDWELL Asbestos Gloves and Mittens. Styles are available with various length gauntlets—with or without lining and with all needed reinforcements.

They are all fully described in the complete catalog of GARDWELL Safety Clothing and Equipment. Send for a copy today.

Safety CLOTHING AND EQUIPMENT Co.
1990 EAST 69TH STREET CLEVELAND 3, OHIO
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Safety Belts and Harness

WHEREVER men work at high levels, or in closed spaces where the air is irrespirable or doubtful, safety belts and harness with life lines are needed.

Occupations in which safety belts are used routinely or occasionally include: linemen, window cleaners, structural steel and bridge workers, cranemen, shipbuilders, forestry workers, miners, mechanics and painters.

In selecting equipment, two types of use must be considered—"normal" and emergency.

Normal use involves comparatively light stresses applied during regular work. These stresses rarely exceed the static weight of the user.

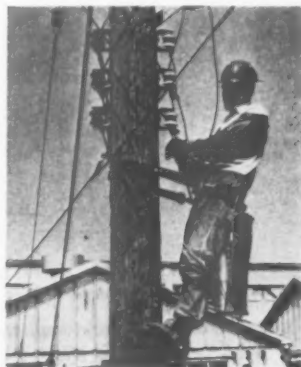
Emergency use means stopping a man when he falls. This may subject every part of the belt to an impact loading many times the weight of the wearer.

Types of Equipment

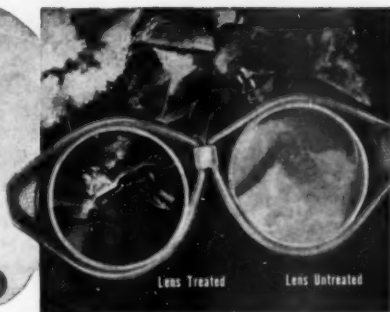
Several types of belt and harness have been developed for various occupations. Most familiar of these are the lineman's belt and safety strap and the window cleaner's belt.

Belts of these types are built for extra severe use. Belting material and hardware have both received much study. The belts are usually serially numbered and dated so that records of age and condition may be kept.

For many occupations a lighter belt will provide ample protection against falls. These may be of the simple body type or the harness type. Both have uses to which a lanyard



Hard hats as well as safety belts are now standard equipment for linemen of Consumers Power Co., Jackson, Mich. The laminated plastic hat protects against electric shock as well as against falling objects such as insulators, tools, etc. (Mine Safety Appliances Co.)

K-LENS-M*Anti-Fogging***LIQUID**

Stops fogging and steaming of eyeglasses and goggles—glass or plastic.
 Easily applied, K-LENS-M Anti-Fogging Liquid forms an invisible coating that resists formation of fog or moisture on lens surfaces . . . brings clear vision to eyeglass wearers under severe conditions of hot steaming vapors, freezing temperatures, humid summer heat, or body perspiration . . . overcomes hazards of fogged goggles . . . increases worker efficiency and safety.



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 (Attaches Securely to Cabinet)

FINGERTIP SPRAY PUMP
 (No Air Pressure Needed)

EASILY INSTALLED—SERVICED
 (Locked In by Cabinet Door)

Make your own test—
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For Demonstration and Free Sample of K-LENS-M—Visit Booth 57—Greater N. Y. Safety Exhibit

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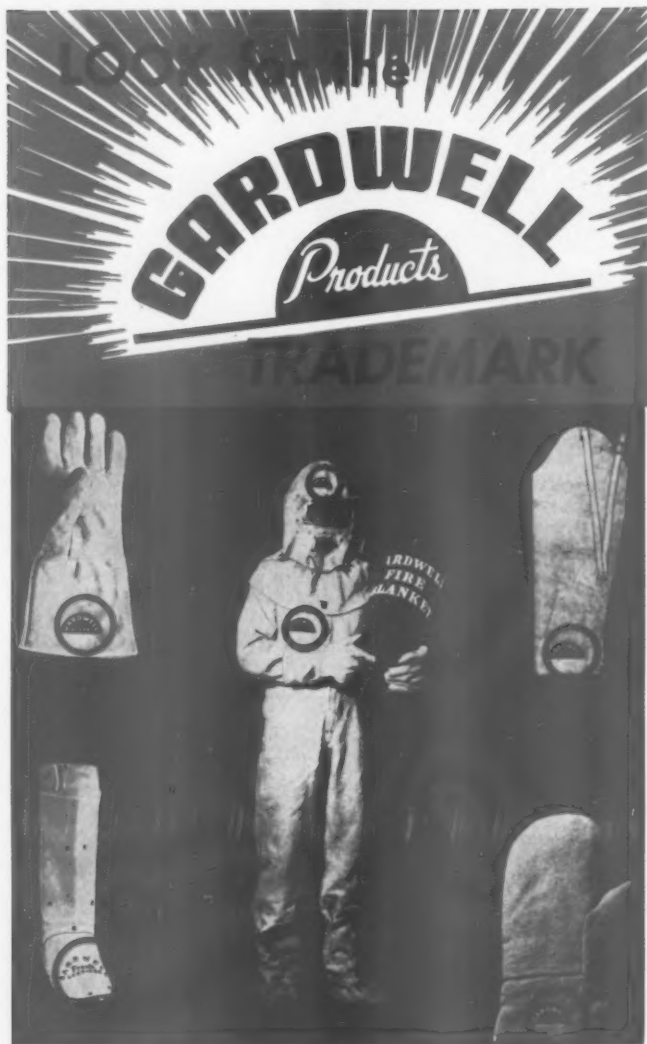
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IT IS YOUR GUARANTEE OF HIGHEST QUALITY

Backed by 27 years of experience, you will find every item that bears the GARDWELL Label to be expertly designed, manufactured from highest quality materials and carefully fabricated to give exceptionally long service.

Write for complete catalog of GARDWELL
Safety Clothing and Equipment.

Safety **CLOTHING AND EQUIPMENT Co.**

1990 EAST 69TH STREET

CLEVELAND 3, OHIO

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is attached. The harness type distributes the shock over the shoulders, back and waist instead of concentrating it at the waist.

Body harness with lanyard attached expedites the rescue of workers overcome by gas or vapors, buried by falls of loose materials or injured in confined spaces. Such equipment should be worn by workers entering tanks, bins and underground passages.

Wherever the work requires a supplied-air respirator, harness and life line should also be used.

If long free falls are possible, the harness should be designed to distribute the impact force over the legs and chest as well as the waist.

The longer the free fall, the greater the impact force exerted upon harness and lanyard. It is therefore advisable to tie off the line as short as movements of the worker will permit.

Materials. Leather and cotton or linen webbing belts are furnished by most manufacturers.

Well tanned and well oiled leather is not easily attacked by most chemicals but it should not be left in contact with them. Regular cleaning after use is important.

Leather $\frac{1}{4}$ inch thick and $1\frac{1}{2}$ inches wide will have an ultimate strength of about 500 pounds. This is adequate for lifting a man out of a tank or bin.

Webbing will stand more heat than leather, and when soaked in water will dry out in its natural condition. Friction buckles can be used with webbing, avoiding the loss of strength at buckle holes.

Belts intended to check a fall demand strength proportionate to the possible distance of fall and weight of body. A 2" by $\frac{1}{4}$ " leather belt would probably arrest the fall of a window washer at 6 feet. It might break at a 10-foot fall.

For a comfortable margin of safety, a window cleaner's leather belt should be at least 3" by $\frac{1}{4}$ ", or the equivalent.

Special types of webbing are available for certain uses. It can be wax treated to resist paint and mildew. For the chemical and petroleum industries webbing impregnated with neoprene resists acid conditions.

Quick release from a safety belt may be desirable in case of fire. Petroleum workers, for instance, use belts with a quick release buckle which can be disengaged instantly by a single motion of the hand.

Belts for some occupations contain loops and pockets for light tools.

Collapsible canvas tool buckets are also needed on some jobs so the worker may have his hands free while climbing. Edge tools should be protected by guards while being carried.

—To page 131

Why

better

INDUSTRIAL
Safeguards?

OPEN END FINGER GUARD

Eliminate minor, but costly, finger injuries by using Steel-Grip finger guards on burring, grinding, buffing, sanding, assembly, machine and punch press operations. Choice of materials. Sizes for men and women.
(U.S. Patents 2,351,906 and 2,461,872)



HAND PAD

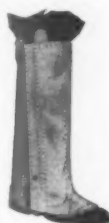
Tough chrome leather; open back for coolness. Also made steel reinforced. Many styles of leather and asbestos hand pads for every job.



Steel-Grip chrome leather gauntlet glove. Reinforced with steel ribbons over tough leather strips for maximum protection and wear on rough jobs. Also made with 2" band cuff and in reversible style.



Woven-Gard open end mitt. For lower temperature jobs where asbestos is not required. Highly oil absorbent. Resists cuts and abrasion. Complete line of Woven-Gard hand pads, arm guards, closed end mitts and aprons.



Chrome leather wrap around legging. Easy on—easy off. Also manufactured in asbestos and flameproofed duck, as well as spring type design in all materials.



Chrome leather welder's half jacket. Available in asbestos and flameproofed duck. Small, medium and large sizes. Extra large and jumbo on request. Complete line of welder's clothing, gloves and mittens.



Chrome leather bib type apron. One-piece construction—no seams. Made in asbestos and flameproofed duck. Choice of lengths in all materials; made plain or steel reinforced. We also manufacture a complete line of waist type aprons.



Asbestos glove. 14" length. Underwriter's 2 1/2 lb. per sq. yd. asbestos with tough chrome leather reinforcement over entire palm, face of all fingers, around entire forefinger and thumb, well around small finger. Thumb seam entirely away from wearing zone. Full line of asbestos gloves and mittens, plain and leather reinforced.

Why do experienced, competent Safety Directors insist on Industrial's Steel-Grip Safeguards? Because the quality of Steel-Grip safety apparel assures proper protection, long economical wear and satisfied workmen.

Savings are not made at the expense of quality. Steel-Grip safety apparel is made from the correct weight, type and character of materials to protect the workman from the various hazards in industry.

The designing and manufacturing of Industrial's complete line of safety apparel is done by trained, skilled, upgraded craftsmen with this thought in mind . . . properly protect the workman at the lowest possible cost . . . not the cheapest.

Let us help you solve your safety problems with our more than 40 years of experience. Write for catalog. Describe your particular hazard. Try Industrial's Steel-Grip quality. You will learn why it pays to insist on the genuine.

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A CORPORATION

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Women like them because they're so smartly tailored. You'll like them because they eliminate clothing hazards, stand up to hard wear and hard laundering. Shop-test any style at our expense. A note on your company letterhead will bring a sample garment in any size without cost or obligation.

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Made of asbestos or wool.
.013 wire-30 mesh. Fibre
head piece combines light
weight with safety. Cat.
No. 602HW-4-A.

additional head protection

by **Kimball**



The greater comfort and safety
provided by these latest additions
to the KIMBALL line of Safety
Clothing are evidence that we will con-
tinue to meet new hazards in working
conditions as they arise.



SKULL CAP. For wear
under hard hats. Warm,
light, comfortable—20
oz. wool. Without flap
SC-1. With flap SC-2.



EAR PROTECTORS. Wire mesh with soft plas-
tic rims. Comfortable and close fitting. With-
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HAND PROTECTION: GLOVES: Welder's, Asbestos, Steel
Stitched. **MITTENS:** Welder's, Asbestos, Steel
Stitched.

BODY PROTECTION: CLOTHING: Wool, Flame-Proofed
Cotton. **LEGGINGS and SPATS:** Leather, Asbestos,
Flame-Proofed Cotton.

APRONS: Leather, Asbestos, Flame-Proofed Cotton.



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YOUR BEST MOVE IS PLY-GARB

OVERALLS
D-100 Dynel

COVERALLS
DC-100 Vinyl-Coated Orlon

SHIRT
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TROUSER
V-400 Vinyon

JACKET
D-100 Dynel

SHOP COAT
D-1000 Dynel

Milburn's **PLY-GARB** offers you the widest range of Plastic, synthetic fiber, chemically resistant clothing available on the market today. These include nationally known *Vinyon N*, Vinyl-coated *Orlon*, *Dynel* and *Aluminised Heat Repellent* fabrics.*

Compare PLY-GARB for WEAR

Shirts, trousers, jackets, coveralls, overalls, shop coats, Plygloves and many other garments; all light and comfortable, soft and flexible, non-irritating. They look right and feel right—make the worker want to wear them.

Compare PLY-GARB for TEAR

Stronger than Airplane Cloth; laboratory-tested for durability. These garments are bar tacked and double stitched at points of strain, sewn with thread made of the same fiber. They will withstand 60 hours of ordinary laundering without cracking or peeling.

Compare PLY-GARB for CARE

Assured protection from Exposuritis in a variety of industrial applications. These materials combat most acids, alkalis, fungi, solvents, abrasives, caustics, moisture absorption and heat. Your silent safety men, they are full cut for maximum comfort.

***Orlon** (Du Pont) — Outstanding resistance to weather and biological attack; low moisture absorption; strength, heat and abrasion resistance good; acid resistance excellent. 50% Spun Fiber, 50% Filament Fiber.

Dynel (Carbide and Carbon Chemicals) — Resists acids, alkalis, fungus and heat; resilience; warmth; low heat resistance; mothproof; dries rapidly. 100% Spun Fiber.

Vinyon (Carbide and Carbon Chemicals) — Similar to properties listed for Dynel. 100% Filament Fiber.

Aluminised Heat Repellent — Applied on cotton, drill, fireproof Duck sheeting, and Vinyon and Dynel sheetings. Repels up to 90% of radiated heat.

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Manufacturers of Ply Skin-Protective Creams and Plastic Coated **PLYGLOV**

Best friends a worker ever had!

STA SAFE

**Longer Lasting
Greater Comfort
More Protection**

Protective Garment Family



GRA-LITE

For jobs requiring maximum chemical resistance and wear, StaSafe GRA-LITE is the recommended leader. GRA-LITE offers a tough, resilient fabric—as much as 40% lighter than other impervious fabrics.

The following garments may be had in any of the above three materials.

- WAIST TYPE APRON
- SPLIT TYPE APRON
- BIB OVERALL
- COVERALL



MAROON

StaSafe MAROON is lightweight and long-wearing. Designed to offer protection against oils, many acids, caustics and solvents. It is also resistant to flame! Less expensive than GRA-LITE, StaSafe MAROON is a practical garment for jobs where body protection is important. Like GRA-LITE, MAROON garments are offered to you in many variations of design.

- OPEN-BACK JACKET
- SLEEVES
- SPATS
- COAT

A third leader . . . AIR-LITE garments are made of electronically sealed, unsupported vinyl film and are designed to fulfill the need for extremely lightweight protective clothing. Ideal for laboratory use and work not requiring a heavier protective fabric.

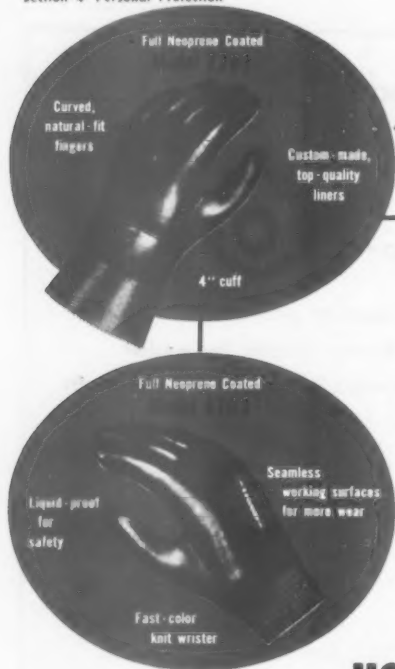


AIR-LITE

For further information on garments suited to your needs—Write today for booklet No. 538.

STANDARD SAFETY
EQUIPMENT COMPANY

232 W. ONTARIO CHICAGO, ILLINOIS



HOOD "pressure vulcanization"
assures safer, longer lasting **GLOVES**

Hood's scientific method of "pressure vulcanization" is a special process where extremely high, controlled heat unites fabric liners with latex film, creating an almost inseparable bond. The latex film is actually driven right into the fabric giving ideal adhesion and preventing separation.

Hood's knowledge, experience, equipment and research in vulcanization brings only one result: superior and safer industrial gloves.

Hood makes a complete line of industrial Rubber Gloves to meet every job requirement. Write today for colorful catalog featuring the Hood Glove Guide which shows you "how to choose the RIGHT Glove for EACH job."



protect vital hands with HOOD GLOVES

HOOD RUBBER CO., Watertown, Mass.

For Clear Safe Vision — Glass and Plastic

K-LENS-M

REG. U.S. PAT. OFF.
**ESSENTIAL
for
EYE SAFETY**



A necessity for effective safety-goggle programs, K-LENS-M Lens Cleaning Products have been standard equipment in leading industries, business offices and government installations for over eleven years. K-LENS-M Lens Cleaning and Anti-Fogging Stations encourage workers to wear goggles by eliminating dirt and fog which hamper vision. K-LENS-M costs little... actually pays for itself in increased efficiency, greater accuracy and fewer accidents.

**Make your own test—
Send for FREE Sample**

GREATEST ADVANCE in eye safety



**SINCE THE
INVENTION
OF GOGGLES**



**The K-LENS-M Liquid Lens Cleaning and Anti-Fogging Station
—the economical, efficient way to clear vision.**

With K-LENS-M Lens Cleaning and Anti-Fogging Stations, your workers can have clear protected vision at all times. Whatever your plant conditions, employees won't have to remove goggles or shields because of dirt or fog—and risk loss of eyesight.

Modernize your eye safety program with

KLENS-M Liquid Lens Cleaner for thorough cleaning of glass or plastic eyewear.

KLENS-M Anti-Fogging Liquid forms an invisible coating on glass or plastic lenses that resists formation of fog or moisture.

KLENS-M Dispenser Cabinet with Anti-Fogging Station is a complete lens cleaning unit; easy to install, use and service.

Contact your safety equipment
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**The WILKINS Co.,
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*mean Safety
First—Last
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PERFECT RESISTANCE TO DUST, FLAME,
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STYLED ATTRACTIVELY, LIGHT IN WEIGHT,
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Thousands of leading safety engineers . . . men who know that minimum risk means maximum production . . . insist **only** on Klear-Vu Safety Caps, Safety Aprons and Safety Arm Guards to protect workers.

Maintain Peak Production—Protect **Your** Workers — Boost Morale — Reduce Overhead —

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PRODUCTS CO., INC. LINCOLN BOULEVARD, MIDDLESEX, N. J.



Wheeler Protection Pays more safety per dollar



APRONS

Bib, split-leg, waist, and V-types. All sizes available in U.G. asbestos, flame-proofed duck, fiberglass, chrome leather, and perma-proof cloth.



ARM PROTECTORS

Chrome leather, or wool. Plain or steel studded leather reinforcements. Fastens on arm with three adjustable straps, or with zippers.



ASBESTOS FIREMEN

U.G. light basket weave asbestos. Six styles offered in one, three, and five piece suits. Each style neatly packed in handy metal carrying case. Used for fighting fires, fire rescue work, and emergency repairs.



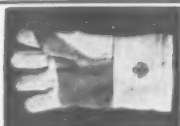
BLANKETS AND CURTAINS

U.G. asbestos, flame-proofed duck and jean cloth, fiberglass, perma-proof cloth, and 100% reprocessed wool. 6' x 6' standard size, packed in carrying case. Other sizes cut to order. Grommets supplied on curtains as specified.



CAPES AND SLEEVES

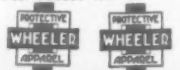
With or without bibs. Made in chrome leather for Welder's. Also available in U.G. heavy basket weave asbestos. Small, medium, and large sizes.



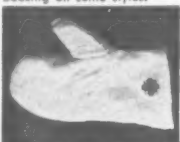
GLOVES U.G. herringbone weave asbestos, 11", 14", & 23" lengths. Lined or unlined; plain or lea. rein.



GLOVES Chrome, horse split or grain, and carpincho leather, 11" & 14" lengths. Lined or unlined; plain or steel studded lea. rein.



HAND PROTECTORS With wrist slot, or thumb-type. Chrome lea. with plain or steel studded rein. Asb. backing on some styles.



MITTENS Reg. thumb, rev. thumb, or one-finger styles. U.G. hrr. asb. 11", 14", & 23" lengths. Lined or unlined; plain or lea. rein. Double, & triple thick asb. mittens also available.

CLOTHING

U.G. asbestos in tropic-weight hrr., light basket, heavy basket, and hrr. weaves: flame-proofed duck and jean cloth; chrome lea., perma-proof cloth, and wool. Coats 30", 44", and 50" lengths, cut to chest size, with "free-swing" raglan sleeves. Pants to match, cut to waist size.



HELMETS

U.G. light basket weave asbestos, with wire, fiber, or "hard boiled" head frames, all having adjustable, padded head bands. Screened, and pyrex glass vision pieces; for head, neck and shoulder protection. Large selection of styles featuring exclusive Wheeler design.



LEGGINGS

U.G. asbestos, flame-proofed duck, or chrome leather. Available in either Patented Leg-Safe style (as shown), or Spring Knee style. On and off in a jiffy! Half Leggings, and Hip Leggings, also obtainable.



SLEEVES

U.G. asbestos, flame-proofed duck, fiberglass, chrome leather, and perma-proof cloth. 12", 18", and 24" lengths.



SPATS

U.G. asbestos, flame-proofed duck, and chrome leather. Have adjustable ankle and instep straps.



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FOR REAL SAFETY SERVICE

Wheeler PROTECTIVE APPAREL, INC.
Write for our new Catalog No G98
224 W. HURON ST. • CHICAGO 10, ILL.

Safety Clothing

—From page 122

Shock absorbers incorporated in harness and lanyards reduce the severity of impact. This decreases both the possibility of injury to the wearer and failure of the equipment.

Lanyards. A ½-inch manila rope has an ultimate strength of about 2,600 pounds.

Research is developing new materials for lanyards. Unolyn, a synthetic fiber, has shown remarkable ability for absorbing impact force. It elongates with constant resistance up to five times the original length. However, after being subjected to severe strain it will not return to its original length and should not be used again.

Nylon rope is relatively high in cost but excellent for life lines. It has high tensile strength, wet or dry, is tough, flexible, durable, and easy to handle.

Care of Belts

Dust should be brushed off carefully so as not to scratch the belt. A leather belt should then be washed with warm water and saddle soap or castile soap. It should be rinsed in clean warm water and allowed to dry in room temperature.

Leather belts should be treated with neatsfoot, castor, soybean or a compound oil, to prevent drying out, not a mineral oil. A leather belt should never be exposed to excessive heat.

Webbing belts may be washed in soapy water, rinsed and dried by moderate heat. They are not damaged by any temperature up to the boiling point of water. The manufacturer of the belt should be consulted about the dressing.

Belts should be inspected before use by the employees wearing them. Every one to three months they should be carefully inspected by a trained individual.

Leather belts especially must be watched carefully for cuts or scratches on the skin side of the hide. A deep cut on the skin side warrants condemning the belt.

Fabric belts should not be used if the outer plies are cut or worn through. All belt hardware should be checked and replaced if it shows signs of wear. If the belt is riveted, each rivet should be examined separately.

Life lines should be washed with mild soap and water and dried in circulating air. They should not be exposed to high temperatures. Rope should be kept in open coils and never bent sharply.

HERE'S LOW COST FOOT PROTECTION!

STANDARD TOE CLIPS



Fits any square toed shoe. Designed for permanent attachment or intermittent wear.

These heavy gauge metal caps reinforced for greater resistance to impact can be worn by any worker who can wear shoes. Low Priced Toe Clips make foot and toe protection possible for all workers.

**TOE CLIPS
OFFER
PROTECTION
COMFORT
LOW PRICE**

WRITE FOR BULLETIN NO. 539

STANDARD SAFETY EQUIPMENT COMPANY

232 W. ONTARIO • CHICAGO, ILLINOIS

TOUGH NEW WORK GLOVE with a TOUGH NEW COATING



SILVERTEX

These toughies will save you money, keep all hands cooler. Silvery coating reflects moderate heat radiation, resists cuts, snags, abrasion, and chemicals, won't crack or peel. Curved finger design, swing thumb, all standard styles.

Write for name of your distributor.

THE
SURETY

RUBBER CO. 100 Hall Avenue, Carrollton, Ohio, Dept. S
IN CANADA: Safety Supply Company, Toronto, Ontario

SENSIBLE SAFETY FOR THE HAIR AND HEAD STASAFE HAIRGARDS



DESIGNED FOR:
SAFETY
COMFORT
APPEARANCE

Many attractive styles and color combinations to choose from. Models for women who prefer the short hair trend—for those who follow the longer hair styling.

ALL MODELS ARE:

- ADJUSTABLE
- LIGHTWEIGHT
- COOL
- SAFE

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LOS ANGELES 16, CAL.
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are your glove costs
too high?



CLEANERS AND
PROCESSORS
OF LEATHER
COTTON AND
RUBBER GOODS

**YOUR COST DEPENDS ON THREE
FACTORS**

- ① Using the correct glove for the job.
- ② Proper stock control. A clean pair for a dirty pair.
- ③ Salvaging by proper cleaning, repair.

Wash-Rite specializes in "Rite-to-Wear" gloves for every job. Complete stocks. Immediate shipment. We have assisted many of the country's largest industries in setting up a money saving glove control system.

"Wash-Rite" is exclusively engaged in the correct and scientific cleaning, sterilizing, repairing, reshaping and processing of industrial work gloves, aprons and other protective clothing.

**REDUCE YOUR COSTS WITH "WASH-RITE'S" PROVEN
SERVICE. SEND US A FREE TRIAL ORDER TODAY!**

Wash-Rite Company, Inc.

1412-26 CORNELL AVENUE • INDIANAPOLIS 2, INDIANA

Hands and Arms

FINGERS, hands and arms are involved in more than one-third of all reported industrial injuries. No parts of the body are more exposed to cuts, scratches, bruises and burns in the course of the day's work.

Finger movement is necessary for practically all work and this makes protection difficult. For the forearm semi-rigid protectors are often practicable.

Finger stalls, gloves, mittens, and hand pads are made of a variety of materials to protect hands against cuts, abrasions and hot objects.

Some of the common materials and their uses are:

Canvas, the least expensive and least durable material, is satisfactory for light work. Duck and terry cloth are also used for handling objects which are not excessively hot.

A strong, closely woven variety of terry cloth is used for "hot mill" gloves.

Leather is more expensive and more durable for most jobs. It offers greater protection against cuts and abrasions.

Chrome leather is used where there is exposure to sparks or molten metal. However, no animal or vegetable material will stand continued excessive heat.



ACME

**... the GAS MASK that
Checks "HUFF and PUFF"**

You can wear the Acme Full-Vision Mask two or three times as long as others without worrying about "huff and puff." An exclusive Acme feature, the Dead Air Check Valve, actually limits the amount of carbon dioxide the wearer rebreathes and thus helps to check breathing difficulties at their source.

This is another Acme innovation that proves that protection can be comfortable.

Write for the complete story on Acme Gas Masks for all occupational hazards.

**ACME Protection
Equipment Company**

3037 WEST LAKE STREET
CHICAGO 12, ILLINOIS

Metal staples in gloves, mittens and hand leathers give increased protection when handling sharp or rough objects. Metal-studded gloves should not be worn around electric apparatus.

Asbestos is used where hands must be protected against extreme heat, as in steel mills, heat treating plants, welding, galvanizing, glass manufacturing, etc.

Asbestos gloves may be obtained unlined or with wool lining for added comfort and protection.

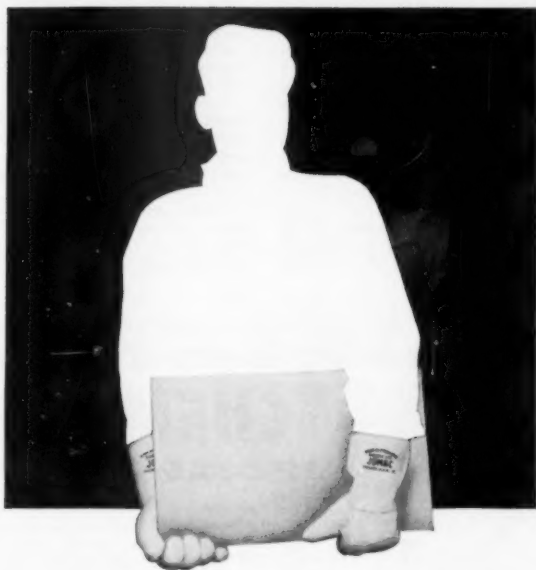
Heat-repelling mittens of aluminum-coated fabric between two layers of asbestos, jersey lined, offer unusual protection against heat. These mittens are reversible.

Rubber, neoprene and vinyl films are suitable for chemical laboratories and plants where acids, and other corrosives are handled.

Neoprene and vinyl are particularly useful where petroleum products and some organic solvents are handled. Synthetic films vary in their resistance to chemicals and the manufacturer should be consulted about specific exposures.

Fabric coated with rubber, neoprene or vinyl are used for light cleaning operations. They offer greater protection against abrasion than uncoated fabric.

When rubber or synthetic gloves are worn for long periods, a light-

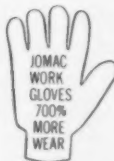


NEVER ABSENT WITHOUT NEED

His hands are protected by Jomac Work Gloves. They prevent nasty burns, cuts and other such injuries. Jomacs resist sharp edges, heat and cold. They help keep workers on the job. And, because they outlast ordinary gloves 700% or more, they help increase production. Jomacs are washable, flexible and reversible. They resist tearing and snagging, too.

SPECIFY JOMACS FOR BETTER PROTECTION

We make Jomac Cloth and Jomac Gloves within our own plant. Because we do, we can guarantee the uniformly high quality of Jomac Work Gloves and the hand protection they provide.



C. WALKER JONES CO.

6135 N. LAMBERT STREET • PHILADELPHIA 38, PA.

More Production for Your Glove Dollars

PIONEER

Stanzails®



It pays you to buy gloves that permit fast and easy work, with protection. No one or two gloves fit all jobs. There's more production in the right glove for each job. PIONEER'S new

R-15 Extra Duty, red neoprene coated fabric, curved fingers, non-slip grip, pre-flex palm and inserted thumb design. Knit wrist.

Stanzail catalog shows you how to buy. Unbiased advice—Stanzails include all kinds of liquidtight gloves: all-neoprene, neoprene and vinyl-coated. 32 styles, weights, sizes, colors. Get dexterity plus utmost protection. Increase production, avoid work stoppage, satisfy workers—write for your Stanzail catalog today!



Industrial Products Division
The **PIONEER** Rubber Co.
637 Tiffin Rd., Willard, Ohio



Over 30 Years of Quality Glove Making

weight cotton liner is desirable. If no liner is available, talcum powder should be shaken into the gloves before wearing.

Rubber and asbestos gloves should be long enough to come well above the wrists. Gauntlets should be equipped with locking devices to assure a snug fit about the wrists. Sleeves should be kept rolled down, leaving no skin exposed.

Metal mesh gloves are used in meat and other cutting. They should fit snugly.

Linemen's gloves. Rubber gloves worn by linemen and others engaged in electrical work are of a special

type made to exacting specifications. They should be tested regularly and discarded when found worn, cracked or punctured.

For line work, overgloves of leather are worn to protect the rubber against damage.

Generally, gloves should not be worn when operating revolving machinery. An exception is buffing and polishing on high-speed lathes where parts become too hot to handle with bare hands.

Wrist and Arm. Gauntlets offer some protection to the wrist, and arm protectors guard the forearm against light blows. The materials,

depending on the protection required, include duck, wool, leather, rubber, plastics, and asbestos.

Protective Creams

Creams are helpful in protecting the skin against many irritants when safety clothing is not practicable. These products are made in water-soluble and water-resistant types, each in several grades for differing exposures.

Water-soluble creams are used for protection against cutting oils, paints, lacquers, varnishes, etc.

Water-resisting applications are used where the cutting oil, cooling lubricant, or other irritant has a water content of more than 10 per cent. These can be removed with soap and warm water.

To be effective, coatings should be renewed frequently. They are not intended for protection against highly corrosive substances.

Foot Protection

—From page 78

Both rubber and neoprene are improved from the antislip standpoint by incorporating some material such as cord or cork in soles and heels.

Cord soles and heels, similar in construction to automobile tires, have been giving good service for many years.

For Greater Safety be sure it's

"CHEM-TEX" APRONS & SLEEVES

FOR ALL AROUND
PROTECTION AGAINST
OILS, GREASES, ACIDS,
SOLVENTS, WATERS, ETC.

APPROVED BY INDUSTRY
for their outstanding ability
to protect against hazards.
"CHEM-TEX" aprons are
proving over and over again
their greater safety value to
management and workers.
"CHEM-TEX" aprons have
cut risks and increased pro-
duction in thousands of
plants. Their comfort, flexi-
bility and proven protection
are acclaimed by workers
everywhere. And their long-
lasting quality is another
reason why management pre-
fers "CHEM-TEX." Made in
sizes and weights to meet
your requirements.



THE NEW KENNEDY "VICTORY" CAP

Better protection
for all the hair
all the time be-
cause the full,
wide, snood-type
back of the new
Kennedy "Vic-
tory" cap permits
complete cover-
age. Easy to put
on. Adjustable to
all head sizes. 11
styles to choose
from.



NEW
special coated ASBESTOS MITT-
gives 3 to 4 times greater wear.

Complete line of asbestos and leather
clothing. Everything for safer industrial
production.

SPECIAL CLOTHING MADE TO
YOUR SPECIFICATIONS.

FOR SAFETY RELY ON KENNEDY

Write Dept. N-1-52 for complete information

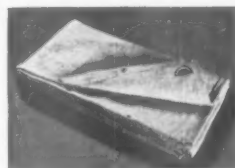
Cap shown is Style No. 202-F. Gloves shown
are made of finest synthetic rubber to offer
protection against oils, acids, greases, chem-
icals, etc.

V. E. KENNEDY CO.

3735 NORTH 35TH STREET
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GARDWELL
Products

GARDWELL ASBESTOS CURTAINS and BLANKETS



GARDWELL Asbestos Curtains are made
from Underwriters Grade Asbestos Cloth
and are equipped with metal eyelets at top
for hanging or with wide hems at top and
bottom for rods. Available in any size.

GARDWELL Asbestos Blankets—made
from Underwriters Grade Asbestos Cloth—
have double sewn seams. Standard size is
66 x 80 inches—also made to order.

These and the complete line of
GARDWELL Safety Clothing and
Equipment are fully described in
the GARDWELL Catalog. Write
for a copy today.

Safety CLOTHING and EQUIPMENT Co.
1900 EAST 69TH STREET CLEVELAND 3, OHIO
PHONE 81

Cork blended with the rubber or neoprene is an excellent material. Slip resistance is good and the soles



Careful fitting results in employee satisfaction and more sales of safety shoes.

are light and flexible. They also help to insulate the feet against heat or cold.

Wood soles are used for extreme conditions of heat, dampness, oil, acids or caustics underfoot. They are popular in steel mills, foundries, and other places where hot operations are carried on. They also afford protection against nails, broken glass,

scrap metal, and other sharp objects.

Wooden-soled shoes can be obtained with steel toecaps or with guards which cover toes and insteps.

Where shower baths are used, paper slippers or wooden sandals are sometimes provided to reduce the danger of foot infection. Paper slippers are destroyed after one use; sandals are disinfected frequently.

Foot Guards

Where unusually heavy objects are handled, feet may need more protection than is provided by shoes with reinforced toes. For such work, foot guards of heavy gauge, flanged and

corrugated metal are obtainable.

The guards are strapped on over the shoes and protect the instep as well as the toes.

With the flange resting on a firm floor surface, foot guards should stand an impact of at least 300 foot-pounds without being dented sufficiently to damage the shoe underneath or injure the foot.

Foot guards are also made with soles of rubber or calked steel to minimize slipping hazards.

Combination shin-foot guards, with an aluminum alloy shin protector hinged to the foot guard, are available.

Are You Fully Protecting the Feet of Your Employees?



"SANKEY" IMPROVED FOOT GUARD equipped with Anti Skid TOE CLIP.

"SANKEY" FOOT GUARDS consist essentially of a metal shield to be worn over the shoe whenever the foot is in danger of being either crushed or cut. The metal shield is designed to furnish a maximum amount of protection to the entire front of the foot—not merely the toes alone, but also to the instep against hazards from falling, rolling or flying objects, or from accidental tool blows. Write for literature or a trial pair.

ELLWOOD SAFETY APPLIANCE COMPANY
219 SIXTH STREET
ELLWOOD CITY, PENNA.



Combination
Foot-Shin Guard



Foot Guard Equipped
With Anti-Skid
Full Sole



Fibre-Shin and
Shin-Knee Guard

FOR YOUR INDUSTRIAL
RUBBER NEEDS SEE

Miller Products Co.

"Industrial Rubber
Headquarters"

Write or telephone today for information and prices on our complete line of super quality Industrial Rubber Products at low prices. Immediate delivery from our New York City warehouse of the following:

- APRONS
- BUCKETS
- GLOVES
- FUNNELS
- CLOTHING
- TUBING
- FOOTWEAR
- DIPPING BASKETS

Send for your FREE copy of our new, fully illustrated catalogue NOW!

Visit our Booths B4-B5, at the
New York Safety Show

Miller Products Company, Inc.



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Orland 7-5335

Eye Conservation

—From page 75

heat-treated or untreated glass or acid-resistant plastic. Some types may be worn over spectacles. The ventilated types are less troubled by fogging.

Dust goggles, leather mask type, for non-corrosive dusts, are made with heat-treated, untreated or filter lenses. Wire screen ventilators around the eye cups provide ventilation.

Ease of cleaning and sterilization are important. Most types now on the market meet these requirements.

Goggles should be fitted as close to the eyes as possible without touching the eyelashes to give the widest possible angle of vision.

Minimum permissible size for oval lenses is 44.5 mm. in the vertical dimension and 48 mm. in the horizontal. Round lenses should be 50 mm. in diameter.

Lenses should have no appreciable distortion or prism effect.

Strength of heat-treated lenses (resistance to impact) should conform to specifications of the Federal Standard Stock Catalog, the Government's official purchasing guide, Specification GGG-G-501B.

Plastic lenses have qualities of op-

tical glass in light transmission and freedom from distortion. They are light in weight and do not fog as readily as glass. They are useful for spotwelding, as molten metal does not adhere to them as readily as to glass. They withstand considerable impact but are marred or scratched more easily than glass.

Harmful Rays

Glass which filters out harmful ultraviolet and infrared rays is available in many types of goggles, face shields and helmets. These filter lenses are worn for welding and cutting, furnace and boiler observation and other operations where there are high temperatures and excessive glare.

Didymium glass is used for protection against bright yellow glare encountered in glass blowing and similar operations. It is also useful for some precision operations in laboratories.

Melters' goggles of cobalt blue glass come in spectacle and cup types in graded shades. Lenses with color in the upper half and clear glass in the lower half are also obtainable.

Sun glasses do not qualify as ray-filter glasses for most industrial exposures. They are designed for protection against discomfort caused by sun glare. The better glasses con-



This welder at National Supply Company's Torrance, Calif., wears a welding helmet and impact goggles at work. To protect near-by workers against welding glare, the company erected this steel box to shield the operation.

form to optical standards but many of the cheaper ones show considerable distortion.

Welding helmets provide protection for the eyes and face under the severe conditions of arc welding. They are attached to headgears so they can be raised for placing the work. Impact goggles worn under the helmet provide protection when the helmet is raised. Helmets are made of dielectric fiber resistant to sparks, molten metal and flying particles, and a poor conductor of heat. Replaceable cover glass protects filter plate.

TYPES OF EXPOSURE	TYPES OF PROTECTION								
	CUP GOGGLES	SPECTACLES	SIDE SHIELDS	PLASTIC EYE SHIELD	PLASTIC FACE SHIELD	WIRE SCREEN SHIELD	FILTER GOGGLES	RUBBER GOGGLES	HOODS
Heavy impact, large particles—Chipping, calking, some riveting operations, sledging in quarries.	X		X						
Moderate impact, protection from dust and small flying particles—Scaling and grinding metals, stone dressing where quartz is not involved, some woodworking operations.		X	X	X	X				
Metal sparks and spatter—Electric spot and butt welding where there is no exposure to excessive energy or excessive glare.			X	X	X				
Splashing metal—babbiting, pouring lead joints for pipes, casting hot metal, dipping in hot metal baths.	X			X	X	X			
Splashing liquids—Handling acids and caustics, dipping in galvanized tanks, some japanning operations.	X				X			X	X
Reflected light and glare—Long exposure to light reflected from snow, water, roads, etc.; incidental glare from furnaces, working near acetylene welding, etc.	X	X	X				X		
Injurious radiant energy—moderate reduction in visible radiant energy—Oxyacetylene welding and cutting.	X								
Injurious radiant energy—Large reduction of visible radiant energy.									X

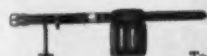
(National Bureau of Standards Handbook H24)

Bashlin's Linemen's Choice

SAFETY EQUIPMENT



Semi-Floating Safety Tool Belt
20 Styles—
Full Range of
Sizes. Stock.



Tool Belt with or without holster with tape sling, hammer loop, snap. Stock.



Clear Grip—Ease E Grip Plier Handles. 9"—8"—7"—6"—420 Pliers. Stock



Safety Straps—24 Styles Finest Leather, Bashlin Craftsmanship. Stock.

Tool Buckets—Canvas, fibre top, leather bottom 12"—16" Depth. Stock.



Chan-Nel-lock gripping tongue and groove Pliers. Stock.

Vacuum Grip Pliers perfect balance easy cutting. Stock.



Lightweight Champions—climbers with removable gaff. Stock.

Chippewa Boot—6 to 11 and 12 with 16" top. With or without Padding. Stock.



W. M. BASHLIN COMPANY
GROVE CITY 3, PA.

BUHRKE

For Construction and Maintenance Safety

NEW!
LOCKING
ROPE SNAP



SAFETY BELTS



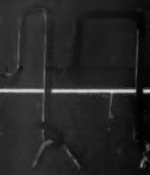
SAFETY HARNESS



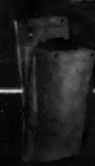
TOOL BAGS



TOOL BUCKETS



NEW INSULATED
BUCKET HOOKS



GLOVE
CARRIERS



TOOL
POCKETS



SAFETY
SNAP



ROPE SLINGS
LANYARDS



NEW!
LOCKING
SAFETY
SNAP

EDGED TOOL GUARDS

SAFETY STRAPS

NEW
LINEMAN'S ULTRA-FLEXIBLE NYLON
SAFETY STRAPS AND CLIMBER STRAPS.
ROT PROOF AND MOISTURE PROOF.
CANVAS AND WEB PRODUCTS.
WRITE FOR DETAILS!

UP

where
**SAFETY
COUNTS**

**IT'S
KLEINS**



201-NE Plier



5233 Klein-Kord
Safety Strap



5249 Klein-Line
Tool Belt



1901-M Climber



1628-3BH Klein Chicago Grip

Safety engineers recognize the importance of quality on hazardous jobs. When it comes to equipment on which life depends—safety straps and belts, climbers and grips, pliers and tools—there can be no compromise with quality.

Nearly a century of experience is back of Klein equipment for linemen and electricians. Today the name Klein is recognized for highest quality wherever such equipment is used. When life is at stake, only *the best* is good enough. In tools and equipment, this best is Kleins—"since 1857."

ASK YOUR SUPPLIER

Foreign Distributor: International Standard
Electric Corp., New York

If you have not received a copy of the new Klein Pocket Tool Guide, write for one. It will be sent without obligation.



Since 1857



Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
1880 BELMONT AVENUE, CHICAGO 14, ILLINOIS

Welding hand shields are used on operations where a helmet is not practical, and on tack welding, set-up work, inspection and time study work. Construction is similar to welding helmets.

Some helmets have a lift-front glass holder which permits rapid inspection of work without removing helmet.

Filter Lenses. The following shade numbers are listed in National Bureau of Standards Handbook H24:

No. 3—For protection against glare or reflected light, spot welding operations, light brazing.

No. 4 or No. 5—Light acetylene cutting and burning.

No. 6—General acetylene welding, or welder's helper or set up on arc welding.

No. 8—Heavy acetylene welding or cutting, or very light arc welding.

No. 10—Arc welding up to 250 amperes.

No. 12—Arc welding of more than 250 amperes, atomic hydrogen welding.

No. 14—Carbon arc welding.

Goggles are available in shades up to No. 8; higher numbers in helmets.

Heat-treated cover lenses can be provided to protect filter lenses against pitting and scratching. Heat-treated filter lenses are also available.

Face Shields

Face shields of transparent plastic give eye and face protection on such jobs as metal sawing, working with chemicals, buffing, sanding, light

—To page 140



We will immediately design or duplicate any belt in any quantity to your exact needs.

Submit your sketches and specs to:

**INDUSTRIAL SAFETY
BELT CORPORATION**
51 CHATHAM ST.
PITTSBURGH, PENNA.

W. H. SALISBURY & CO.

MORGAN AT KINZIE STREETS

★ EST. 1855 ★

CHICAGO 22, ILLINOIS

MANUFACTURERS OF RUBBER PROTECTIVE EQUIPMENT
FOR LINEMEN AND OTHER HIGH VOLTAGE WORKERS

INTERLOCKING LINE HOSE



Completely surrounds the wire with a thick wall of rubber having high dielectric strength. Locks itself in place but is easy to apply or remove.

Sizes: $\frac{3}{8}$ ", 1", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ " inside diameter.

Lengths: 3', 4 $\frac{1}{2}$ ', 6'.

RUBBER INSULATOR HOODS



Used in conjunction with Line Hose to cover conductors as they pass over insulators. Inward extending flanges prevent accidental dislodgement. Compact construction. Convenient to handle.

CONNECTOR-END LINE HOSE



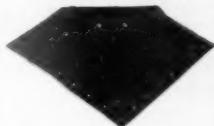
Standard Line Hose with built-on connector-end for joining to additional lengths or for covering enlarged wire taps, leads on stud type transformers, etc. Sizes same as standard line hose.

LINEMEN'S RUBBER BLANKETS



Indispensable for covering odd shaped equipment. Made of best grade rubber with long-life and high dielectric qualities. Sizes 36"x36" and 36"x27". Also available with "Snap-Button" and eye-lets.

SNAP-BUTTON RUBBER JACKETS



Highest quality small size rubber blanket, 22"x22", equipped with Salisbury hard rubber button fasteners and used to cover dead ends or other similar hazards that require secure fastened protection.

LINEMEN'S TOOL BAGS



Non-metallic canvas bags properly shaped and constructed for safety in raising heavy tools and supplies to men on poles or other elevated places. Sizes 8"x14" or 12"x16" for tools and 7"x48" for line hose.

LINEMEN'S RUBBER SLEEVES



Protect the arms and shoulders from accidental contact with "hot" equipment. Held in place by adjustable rubber strap across the shoulders. Made in chromium plated molds to insure high voltage resistance, smooth surface and long life. Regular and extra large sizes.

NON-SPILLABLE P. B. COMPOUND POTS

Provide a safe and convenient means to carry insulating paint and brush. Being made of semi-hard synthetic rubber, they are non-conducting, non-breakable and are unaffected by the usual P. B. compound used.



LINEMEN'S GLOVE BAGS



Necessary for glove protection in storage and transportation and useful, when properly labeled, for personal identification. Made of heavy waterproof duck, sturdy and durable. Snap hook and "D" ring attached. Size 8" wide, 15" long.

LINEMEN'S RUBBER GLOVES

Best grade steam-cured gloves, carefully made to meet all standard specifications. Furnished in curved or straight finger style. Standard gloves are rated at 10,000 volts, 14", 16", 18" lengths.

15,000 or 20,000 volt gloves are available. All sizes and half sizes from 9 to 12.



RUBBERCUFF PROTECTOR GLOVES

Similar to our standard all-leather protector glove with the addition of a full-length molded rubber cuff. Rubber cuffs do not increase current creepage to the forearm. They prevent costly snags in gauntlets of linemen's rubber gloves which are required to extend beyond ordinary leather protectors. Furnished in several sizes to fit perfectly over rubber gloves.



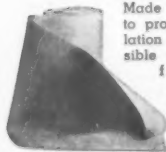
ALL-LEATHER PROTECTOR GLOVES

Worn over rubber gloves to protect them from injury. Made of specially tanned Grade "A" buffed horsehide and carefully designed to fit perfectly over rubber gloves. Soft and pliable under all conditions. Do not become slippery when wet. Band-top or gauntlet styles. All sizes.



A DEVICE FOR EVERY ELECTRICAL HAZARD

SWITCHBOARD MATTING



Made especially to provide insulation from possible ground in front of switchboards or other electrical equipment.

Rated at 40,000 volts and meets the A. S. T. M. specifications. Widths 24", 30", 36", 48". Any length.

MISCELLANEOUS EQUIPMENT

Static Resisting Rain Coats

Electric All-Rubber Rain Coats

Industrial Rubber Rain Coats

Linemen's Rubber Boots

Linemen's Rubber Hats

Cotton Liner Gloves

Marshall Tagging Device

Elbow Length Sleeves

Slotted Side Blankets

All-Rubber

Cable Bandages

Blanket Canisters

Blanket Clamp Pins

Linemen's

Sleeve Containers

Cable End Test Caps

and Separators

ELECTRICIAN'S INSULATING STOOLS



Designed to provide a safe, low platform for men with hazardous tasks in substations, underground vaults and power plants. Size 18" x 12" x 8" high. Guaranteed.

★ SEND FOR CATALOG L-4 ★



ASTERMA
ACTS in 3 ways at ONCE
PROTECTION-PREVENTION-ALLEVATION

Used successfully for a number of years in all types of industries for skin protection of workers.

PROTECTION against irritating and drying materials.

ASTERMA'S lubricating action is effective in the removal of inks, paints, dyes, dirt, grime, grease, oils, aids in preventing skin-disorders by keeping skin clean and soft.

In constant use in Industrial Hospitals for a number of years for First Aid, all types of burns, cuts, bruises, etc. Recommended and prescribed by Physicians and Skin Specialists.

Some choice territories open for distributors.

Information and samples to industries upon request.



ASTRA Laboratory, Inc.,

Scotia, New York



The Answer to INDUSTRIAL DERMATITIS
is just as simple as this...

... in some of the even larger plants, they have found that by using only two types of Skin-Cote, they get complete protection and have reduced dermatitis to one of their minor hazards... to a problem of simply seeing that the employees use it. To encourage the use of Skin-Cote, more and more companies are supplying it in individual jars rather than issuing it from *bulk containers in the tool crib... Send for eight-page catalog and complete information—you will find that the answer to Industrial Dermatitis can be just as simple as this.

*Available in individual jars or bulk containers.

The BOYER-CAMPBELL Company
 6542 St. Antoine *Safety Division* Detroit 2, Mich.

Eye Conservation

—From page 138

grinding, bottle manufacturing, etc.

They should not be used for welding, heavy grinding or other operations where resistance to severe impact is necessary. Shields may be worn over spectacles.

Wire mesh screens are used for pouring low-melting point metals, as in babbiting. The mesh stops splashes of metal and allows better ventilation than a solid shield.

Sweatbands, worn across the forehead in hot, humid locations, help prevent fogging of goggles and spectacles.

Non-fogging compounds, applied to the lenses, help to keep the glass clear.

Hoods and Helmets

Hoods (loose-fitting) and helmets (rigid frame) of various types are worn to protect the face and head against hazards which do not involve heavy impact.

These are equipped with windows but goggles may be worn underneath. If toxic fumes, dusts or gases are encountered, an air line should be supplied. As these hoods are rather warm, an air line may also be desirable for comfort.

Fabric hoods protect the wearer from nuisance dusts, paint spray, etc.

Fire-resistant duck and asbestos hoods are used for varying degrees of exposure to heat, as in furnace and burning operations and fire fighting.

Hoods and helmets of rubber, neoprene, plastic film, and fabric impregnated with rubber or plastic provide protection against sprays and splashes of acids, caustics, organic solvents, etc. Not all of these materials are resistant to all exposures and the manufacturer should be consulted.

Administering the Program

Supply and Distribution. In some companies the supply is kept in the main supply department. In larger plants a supply of goggles and repair parts may be kept in each shop.

Some operate goggle carts with trained attendants who make the rounds, cleaning, adjusting, repairing and replacing goggles on the job.

Fitting goggles. Prescription glasses should be fitted by a refractonist but fitting plano goggles also requires training and experience. Many optical companies offer instruction in this work. Unless goggles are fitted properly there will be considerable opposition to the eye protection program.

Cleaning and sterilizing. Both goggles and spectacles become smudged and facilities for cleaning



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them on the job are desirable. Stations which dispense cleaning liquid and tissues encourage frequent cleaning.

Goggles worn continuously by one person should be cleaned and sterilized at frequent intervals, as well as those reassigned to other employees.

To Conserve Eyes

1. Make periodic surveys of work areas for eye hazards.
2. Provide type of protection suitable for the job—goggles, shields, masks, hoods, etc.
3. Make provision for corrective goggles for those who need them.
4. Provide goggle-adjusting service and encourage employees to keep their goggles in adjustment.
5. Be sure that all those in the work area have goggles, including employees from other departments.
6. Encourage employees to report foreign bodies in the eye immediately for medical treatment.
7. Supervisors should wear goggles for their own protection as well as to set an example to employees.
8. Allow no visitors without eye protection.

Hearing Aids

DEAF persons can work with normal efficiency and safety in many jobs. In other occupations, however, deafness may be a handicap and a hazard to the individual and his fellow workers. Salvaging the skills of persons with defective hearing is an important phase of vocational rehabilitation.

Many persons with varying degrees of deafness have been helped by hearing aids. For best results, these devices require careful fitting and usually service at intervals after fitting.

The American Medical Association maintains a list of hearing devices which meet essential requirements. Helpful information is also contained in National Bureau of Standards Circular 516, "Selection of Hearing Aids."

Audiometric examinations are useful in measuring progressive loss of hearing. When hearing has suffered from exposure to excessive noise, an employee may be transferred to quieter surroundings.

Ear Protection

A wad of cotton is the simplest and least effective type of ear protector. Audiometric readings show that it lowers the sound 10 to 15 decibels, depending on how well it is packed into the ears. Cotton does serve to keep out foreign material.

Rubber ear protectors are reported to lower sound 20 to 25 decibels. An ear protector of a special compound of neoprene was developed during the war. The neoprene used is non-irritating and almost as tough and elastic as gum rubber. It is more resistant to ear wax and cleaning alcohol.

Fitting a rubber stopper into the ear canal so that noise does not leak around the edges may develop uncomfortable points of pressure. To overcome this difficulty, individually fitted ear molds have been developed.

To make the mold a plaster cast is made in the wearer's ear. The cast is then used to prepare a lucite plug which is non-shattering, nonflammable, and has a relatively low coefficient of expansion. The lucite plug reduces noises 30 to 40 decibels. Ordinary conversation is heard without difficulty, an important property when instructions and warnings must be heard.

Soft plastic placed directly in the ear canal and allowed to harden is another type. After it is withdrawn from the ear, surplus material and sharp edges are removed. The inner end of the mold is coated with rubber and heat treated before use.

An expendable ear mold consists of a mixture of wax and cotton which is softened and shaped with the fingers before insertion in the ear. The mold is discarded when soiled.

Respiratory Protection

—From page 77

but also mechanical protection for the head and neck. This protection can be supplied either by an impregnated cloth hood or by a helmet of some rigid material. It should be covered both inside and outside with a plastic material, such as soft rubber, to increase both comfort of wearer and resistance to abrasive.

A window of transparent material, suitable for optical use, protected from the abrasive by a 30- to 40-mesh fine wire screen should be provided. Both window and protective screen should be readily replaceable.

Self-Contained Apparatus

When it is necessary to work in atmospheres immediately hazardous to life at distances from the source of fresh air greater than the 150 feet provided by a hose mask, self-contained apparatus furnishing oxygen or air may be used.

Care of Equipment

A central station for care and maintenance of respiratory equipment is desirable where many respirators are in use. Such a unit can also handle the distribution and maintenance of other items of personal protective equipment.

Each employee should be provided with two respirators and either a

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locker or a hook at the central station. Respirators should be branded or tagged with a number to indicate the employee to whom it is assigned.

The respirator should be turned in to the central station at the end of each shift to be cleaned and sterilized, and repaired if necessary.

Where the maintenance crew works several shifts, one respirator per employee may be sufficient. Usually, however, it is necessary to have one complete unit in the process of cleaning while the other is being worn.

Filters should be replaced when clogged, and the used ones discarded. Canisters should be replaced at regular intervals as recommended by the Bureau of Mines. Even when not in use they lose their effectiveness with time.

Cleaning and disinfecting. All parts, except canisters and cartridges, should be cleaned after use. Face pieces, air lines and hoses may be washed with soap and water, rinsed in clear water, and dried.

All respiratory devices should be disinfected before being passed from employee to employee. Methods of disinfection include:

1. Immersion in solution of quaternary ammonium salt detergent. This material is not injurious to skin or to rubber.

2. Subjection to a moist atmosphere of antiseptic gas, such as formaldehyde, for 10 minutes.

3. Immersion for 10 minutes in a solution of formalin made by dissolving 1 part of 40 per cent formaldehyde in 9 parts of water.

Parts should be rinsed thoroughly after sterilizing to remove traces of disinfectant, then dried.

Elastic head bands may be damaged by sterilizing but they should be washed with soap and water. Bands should be replaced when the respirator is transferred to another employee.

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Hard hats are generally worn to protect the head against falling objects. But in this case the hat protected the falling object—the wearer's head.

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Industrial Panel

—From page 74

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return it if it has to be repaired or replaced. In case he quits, he must check back with all equipment issued to him, or he must pay for any loss.

In the case of prescription safety glasses the employer pays half of the cost. Ordering and deductions through the payroll are taken care of by the safety department. This is the only item charged to the employee.

When lenses or spectacles are scratched, temples are loose or broken, they are brought into the safety department for repair and others are issued. Respirators are handled in the same manner. Goggles, too, require frequent replacement of headbands, filter lens, coverglass lens, and super armorplate lens.

All safety equipment brought in for repair or replacement is cleaned and sterilized before re-use. Parts are kept in the safety department so that any piece of equipment can be repaired and placed back in service after it is sterilized and placed in cellophane bags for re-issue.

When stock of safety items gets low, we re-order, and all such stock is charged against our inventory. As the various items are issued, a requisition is filled out and a charge made against the mine at which the miner works. Repair parts are prorated against all of the mines, so there is no charge when small repairs are made and parts used.



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Modern Handling Methods

MATERIALS HANDLING has been defined as "the science and art of conveying, elevating, hauling, transporting and handling materials from one location to another."

Materials handling also includes storage and warehousing of materials while in process, in the finished state, and awaiting distribution.

Modern handling methods have been planned to tie in with production methods. To meet these needs, a great variety of handling devices has been developed. By taking the strain off human muscles and reduc-

ing the exposure to many hazardous processes, mechanical equipment for handling materials has contributed much to improved safety conditions in industry.

Where large quantities of materials move in more or less continuous flow in fixed paths, conveyors, traveling cranes, railroads and elevators are used.

When goods move intermittently between many points in plant and yard without regard to fixed limits, mobile trucks of many types and tractors and trailers are employed.

Every plant needs portable types of equipment. In the smaller plant they may serve all handling needs. In the larger plant they are useful auxiliaries to fixed systems.

Basic equipment. This discussion will be concerned chiefly with portable equipment in common use, including:

1. Wheelbarrows
2. Hand trucks
3. Hand lift trucks
4. Powered hand trucks
5. Industrial power trucks
6. Hoists
7. Cranes
8. Conveyors
9. Slings and accessories
10. Miscellaneous equipment — Skids, pallets, steel strapping, grabs, tote boxes, bridge plates, dollies, etc.

Load-Bearing Part

Wire rope, chain and fiber rope are important wherever loads are lifted or hauled. These products are built to meet exacting specifications and their capacities are listed according to size, material and type of construction.

Slings made of these materials, and their accessories, such as hooks, rings, etc., can be obtained from

manufacturers planned to meet the needs of every hoisting job.

These parts are subjected regularly to heavy loads, sometimes overloads. They should be selected for the needs of the job and kept serviceable by regular inspection and maintenance.

Unit Loading

Assembly of loads on skids, pallets or trailers to be moved from one part of the plant to another means less handling and more pieces per each handling. To move the load it is only necessary for the truck to slide the platform or fork under the skid or pallet or to hook a tractor to the trailer.

A **skid** is a platform elevated from the floor by legs, casters or special attachments.

A **pallet** is a modern development of the platform skid. The most common type is the double-faced wooden pallet with sufficient clearance between top and bottom to insert the forks of a fork truck for moving.

Steel strapping provides a secure method of fastening some types of bundled materials for shipping and for reinforcing packing cases. Workers need training in application and

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Unit-load bundle for handling box shooks without pallets. Loads are made up with small openings near the bottom of each bundle. Openings are used as fork entries. Steel strapping makes a secure bundle. (The Baker-Raulang Co.)

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Wire Rope

WIRE ROPE provides high tensile strength and moderate flexibility for heavy lifting and haulage and for supporting rigging. It is serviceable under varying weather conditions but it should not be exposed to excessive heat or corrosive substances nor dragged over abrasive surfaces.

In selecting wire rope, the following should be considered:

1. Size
2. Construction
3. Grade
4. Equipment on which rope is to operate
5. Handling, installation and maintenance of the rope.

Constructions

Wire rope is manufactured in a variety of constructions, each designed for certain service conditions.

In designating construction, the first numeral identifies the number of strands in the rope, the second, the number of wires in each strand. This is followed by a term describing the geometric arrangement of wires in each strand, e.g., 6 x 19 Filler Wire.

The 6 x 19 construction is the most generally useful. As the number of wires per strand increases, flexibility and reserve strength increase but ability to withstand abrasion decreases. A 6 x 7 construction has higher resistance to abrasion but less flexibility.

The core serves as a foundation for the strands. Three types of cores are used: (1) fiber; (2) independent wire rope, and (3) wire strand. Fiber gives elasticity to the rope and is adequate for normal operating conditions.

Metal cores are used where maximum strength and minimum stretch are important, or where heavy loads or overwinding on a drum causes excessive pressure of strands against the core, or temperature is sufficient to dry out a fiber core.

Type of Lay. There are two general methods of laying up rope: (1) Regular lay in which the wires in the strands are laid in the opposite direction to that of the strands in the rope, so that on the outside of the rope the wires lay approximately parallel to the rope axis; (2) Lang lay rope, in which the wires and strands are laid in the same direction.

Regular lay ropes are standard for most applications. They are easier to handle during installation and less susceptible to kinking.

Lang lay rope has good flexibility and high resistance to abrasion and fatigue.

Wire ropes are made either right or left lay. In most cases it makes little or no difference which type is used; right lay is standard.

Rope Grades

Rope wires are usually made of the following materials and designated by their names. (Minimum tensile strengths are quoted from Federal Specifications RR-571 a.)

Improved plow steel. Has highest strength and toughness and most wear resistant properties. Most frequently selected for heavy duty service, as in deep shafts and on excavating machinery. Minimum tensile strengths, 218,000-244,000 p.s.i.

Plow Steel. Strength about 15 per cent less than improved plow steel. Serviceable for haulage, hoisting, logging and miscellaneous service. Minimum tensile strengths, 190,000-212,000 p.s.i.

Mild Plow Steel. Combines toughness with pliability, making it capable of undergoing repeated impact stresses. Used principally for cable tool drilling. Minimum tensile strengths, 165,000-184,000 p.s.i.

Cast Steel. Where strength is not the controlling factor, its pliability is important in long fatigue life. Resistant to acid mine water. (Not listed in Federal Specifications.)

Traction Steel. Used in hoisting ropes for traction type elevators. High resistance to bending fatigue and minimum abrasive action on sheaves and drums. Minimum tensile strength, about 160,000 p.s.i.

Iron. Low tensile strength (about 70,000 p.s.i.) but very ductile. It has been used principally in elevator service where it is being replaced by traction steel.



Variable speed air hoist is suitable for delicate operation and where there is a chance of getting fingers caught. (Link-Belt Co.)

Corrosion-resisting metals. Where corrosion is a factor, stainless steel, bronze and monel metal are frequently used. All-metal ropes are preferred to fiber core ropes.

Stainless steel is used in marine operations, on aircraft, and where rope is exposed to alkali, acids of an oxidizing nature (such as nitric), neutral brine, food products, and temperatures damaging to carbon steel ropes.

Bronze has strength slightly in excess of iron rope. It is used frequently in marine service.

Monel metal is used where rope is exposed to marine atmospheres, acids of a reducing nature (such as sulfuric, muriatic and hydrofluoric), neutral brines, food products, pickling solutions, and aromatic chemicals.

Corrosion-resisting ropes are furnished in complete assemblies and slings with fittings attached. Temperature, humidity, nature and concentration of corroding chemicals should be considered in selecting equipment.

Wire Rope Slings

Wire rope slings are widely used for heavy lifting. Wire rope should not be used, however, where there are sharp bends over an unyielding surface. Tension of outside strands may cause serious injury to the rope.

Where a load has sharp corners, pads should be placed between the load and the sling.

The maximum load can be lifted when all legs of the sling are in a vertical position. The smaller the angle formed between the legs of the sling and the horizontal, the greater the tension on the legs of the sling and the less weight which can be lifted.

Proper selection and attachment of fittings have much to do with rope life and safety. Principal connections and attachments are:

- Babbitt or zinc socketed connections
- Wedge sockets
- Swaged attachments
- Thimble with clip connections
- Three-bolt clamp connection
- Spliced eye and thimble connection

When slings are to be used for special purposes the advice of the manufacturer should be obtained.

Preformed Wire Rope

A preformed wire rope is one in which each individual strand, and at the same time each individual wire, is permanently formed into the helical shape it will assume in the finished rope. Some advantages of preformed rope are:

1. Higher resistance to bending fatigue.
2. Greater flexibility.
3. Less susceptible to kinking and therefore easier to install.
4. More equal distribution of load on each strand and wire.



Ten-ton coils of strip steel handled by specially built tongs at Ford's Rouge plant. Tongs eliminate need of ground crew to fasten load. The signalman merely spots the location for crane men. (Heppenstall Co.)

5. More resistant to whipping and vibration.

6. Hugs small drums better and winds more uniformly and smoothly.

7. Operates over sheaves with less rotation around its axis, resulting in less wear on rope and sheaves.

8. May be socketed with less danger of unbalancing the lay of the rope below the base of the socket.

9. Does not unravel when seizings are removed from ends of rope.

10. When outer wires break through fatigue, they do not protrude or "porcupine." This reduces risk of injury in handling.

Since broken wires are less conspicuous in preformed rope, greater care is needed in inspection. However, broken ends separate slightly, permitting detection.

Strength and other qualities are the same for preformed and non-preformed rope of the same size, grade and construction.

Causes of Failure

When wire rope fails to give the expected service, the reason is seldom a defect in the construction of the rope. Following are some of the more common causes:

1. Use of rope of incorrect size, construction or grade.

2. Allowing rope to drag over obstacles.

3. Lack of proper lubrication.

4. Sheaves and drums of inadequate size, causing short radius bends.

5. Overwinding or crosswinding on drums.

6. Sheaves and drums defective or out of alignment.

7. Ropes jumping sheave flanges.

8. Effects of heat, moisture, or acid fumes.

9. Improper fittings.

10. Permitting ropes to untwist.

—To page 159

Chain for Industrial Use

STRENGTH and flexibility, resistance to abrasion, heat, shock, wear and corrosion are qualities which make chain suitable for heavy hoisting and haulage jobs. It should be remembered, however, that not all types of chain measure up to the requirements of specific jobs.

Conditions under which chain will operate should be considered in selecting types. Impact loading factors should be considered and allowance made for bumpy craneways, rapid lifts and sudden stops. Heat, corrosive atmosphere, and unnatural strains also affect the selection.

Specifications for various types of chain have been compiled by the American Society for Testing Materials. The safe load may be determined from tables issued by the manufacturer.

Safe working load means the maximum load which should be applied to a chain in direct tension.

Breaking loads are merely of theoretical interest. They are misleading to the user and apt to promote unsafe practices.

Proof test means the actual test in pounds applied to the chain and attachments before leaving the factory. Proof test figures should not be considered as safe working loads. These tests are followed by visual link-by-link inspection by experienced inspectors.

Types of Chain

Conditions of use are important and the manufacturer should be consulted about applications for the various types.

Following are types commonly used in industrial operations:

Wrought iron chain (crane or dredge) has high resistance to shock fatigue and corrosion. This chain has close links and is used for slings, hoists, cranes, power shovels, and marine purposes where human life and property depend on its endurance.

Welded steel chain (low carbon) is made in three common types: Proof Coil, BBB, and Steel Loading.

Proof Coil is used principally for towing, binding, logging and similar operations. Links are comparatively long. Proof Coil chain is not suitable for lifting or for slings.

BBB Coil is a higher grade than proof coil, with safe working load approximately 25 per cent greater. Shorter links give greater flexibility. BBB coil chain is not suitable for lifting or for slings.

Steel loading chain has a tensile strength approximately 50 per cent higher than BBB. It is used in the logging industry for binding and loading logs and in oil fields for handling pipe and heavy equipment.

High test chain (high carbon) is heat-treated to give it high tensile strength and resistance to impact loads. Tensile strength is approximately double that of ordinary steel chain. Ductility is moderate. Where resistance to wear is most important, it permits use of smaller and lighter chain.

Alloy steel chain (general purpose) has exceptional strength for weight and size. It is resistant to some types of corrosion. It is frequently used where maximum tensile strength and resistance to abrasion is required, with reasonable resistance to impact.

Special purpose alloy chain is considerably higher in cost and is used on high temperature operations and where resistance to the action of corrosive substances is required.

Stainless steel is high in tensile strength, fair in elongation, but low in impact resistance. It is used chiefly for ornamental installations and nitric acid pickling.

Monel has fair tensile and impact strength and elongation. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Bronze has good elongation and fair resistance to impact, but low tensile strength. It is resistant to sulphuric and hydrochloric acid solutions but not to nitric.

Specialized types of chains have been developed for certain industries, such as those used in marine operations.

Finishes are sometimes added to chains to provide added protection from corrosion or for decorative effect.

Nickel alloy steel hoisting chain is approximately twice as strong as iron chain of the same size. It meets ASTM elongation requirements for iron crane and proof coil chain. It can be used over a wider range of temperature and is relatively immune to failure resulting from fatigue stresses and cold working of the metal.

Storage. When not in use, each chain should be hung on a rack or placed in a neat pile on a dry floor or platform where it will not create a tripping hazard. Exposure to corrosive fumes or liquids should be avoided.

Safe Loads. Some plants stamp on a metal tag attached to each chain the safe vertical load which may be lifted with that chain. A better way is to stamp the safe load, or a reference number, on the ring or hook. Stamp marks should not be placed on links where they might form points of weakness.

The useful life of all material handling equipment, particularly rope and chain, is shortened by overloading, jerking, and neglect of the main-

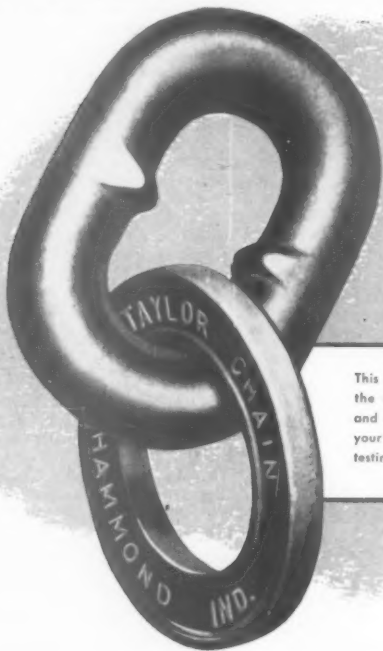
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Chain Slings

Chain slings are furnished complete with all attachments made to proper dimensions and of material specified for various uses with ample factor of safety.

Rings and hooks are as important as the chain itself and should receive the same attention in inspection and maintenance.

A hook bent by overloading should not be repaired and put back into service. The stress of bending weakens metal so that its future strength is unreliable.

Fiber Rope

FIBER ROPE is widely used for block and tackle work, for suspending scaffolds and staging, in marine operations, and for life lines and lanyards. It can be tied and spliced easily and its flexibility adapts it to many uses.

The best fibers have good tensile strength and resistance to weather and abrasion. When the larger sizes of fiber rope would be indicated for heavy loads, wire rope furnishes the required strength with less bulk.

Fiber rope should never be exposed to high temperatures or to acid or acid fumes. Sharp bends should be avoided. Where a sling passes over sharp edges pads should be used to protect the rope.

Rope should not be kept in stock for long periods. Vegetable fiber deteriorates with age, even under favorable conditions. When rope is used only at long intervals, age should be considered in its use and retirement.

Natural Fibers

Manila fiber is standard for tensile strength and durability. A good grade of manila rope, when new and clean, is hard but pliant, yellowish in color with a silvery pearl luster. When drawn through the hands, it has a smooth, almost silky feel.

Sisal is the next best fiber. Strength varies from 65 to 80 per cent of manila. Sisal rope has a yellowish color, with sometimes a slight greenish tinge. It lacks the gloss and smoothness of good manila. Sisal fibers are stiff with a tendency to splinter.

Mexican sisalana (henequin) lacks the strength of high quality sisal but has been used to some extent during the shortage of better grades of rope. Strength is about 60 per cent of manila.

American hemp fiber is much softer than manila. It has a dark gray color. It is not highly resistant to abrasion but when tarred it will give fair service on some jobs.

FIBER ROPE MAINTENANCE

THE life of fiber rope and safety in its use depend greatly upon the good treatment the rope receives. Some good maintenance suggestions include:

1. Prevent the rope from kinking. (See Safety Instruction Card No. 103.)
2. Use blocks of sufficient size to allow the rope free play in sheave grooves.
3. Rope is injured by being dragged over the ground, over uneven surfaces, or bent over sharp corners. In making rope fast, select a round smooth surface, or use pads to protect it.
4. Keep rope from freezing. Throw out a rope slowly; high temperatures destroy the rope rapidly.
5. Alternate wetting and drying cause injury to rope fibers. If the rope is to be exposed to weather continually, it should be treated with a preservative from time to time.
6. Prevent the rope from coming in contact with acid.
7. Coil damp rope loosely and hang it up to dry. Clean dirty rope thoroughly and dry it before storing. (See Safety Instruction Card No. 100.)
8. Store rope in a clean dry place where it will not be exposed to high temperature.



SAFETY INSTRUCTION CARD No. 106

Strength is about 80 per cent of manila.

Jute and cotton are not recommended for handling material or other uses where strength and durability are needed. Strength is about 50 per cent of manila.

Synthetic Fibers

Nylon has a high rating for tensile strength, toughness, flexibility and durability. It is easy to handle.

Nylon rope has a higher tensile strength, wet or dry, than natural fibers and does not show marked deterioration when frozen. Melting at 480 degrees F., it can be readily destroyed by fire but it does not ignite and burn with flame. It is unaffected by rot or mildew. Attacked by acids but resistant to alkalis.

Ropes of synthetic fibers are coming into wider use. They are more expensive than natural fibers, which restricts their use to certain specialized operations.

Unolyn, a new synthetic fiber, has shown desirable qualities for life lines. It has unusual ability to absorb impact force but does not return to its original length after being subjected to severe strain. It is not suitable for hoisting or haulage.

Glass. High strength when dry but low resistance to flexing and abrasion. Poor performance when wet reported.

Saran. Resistant to rot and many chemicals. Practically unaffected by aging, direct sunlight and moisture. Only moderate resistance to abrasion and temperature.

Care of Rope

Rope loaded over 70 per cent of its breaking strength will be per-

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There are many different styles of shackles, swivels, hooks, thimbles, clips, sockets, eye bolts and other products designed for a wide variety of applications throughout industry. If you use wire rope or chain, you can be sure that Laughlin has the right — and safest — fittings for the job.

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Safety "FIST GRIP" Wire Rope Clips . . . Fool proof, easy to install. Fist Grip clips hold rope more securely, can't go on wrong. Fewer clips are required than for ordinary types, and they will not crush or distort the rope.

SAFETY HOOKS . . . The latch locks the load, will not open until released by operator. Strong, drop forged steel hook has improved latch that leaves 80% of throat opening. 15 sizes; 3 patterns, eye, shank and swivel.



"MISSING LINK" (Reg. U.S. Pat. Off.) . . . Cheaper than welding, safer than cold shut or cast link. "Missing Links" go on in a jiffy and are stronger than proof coil chain. 17 sizes from 3/16" to 1 7/8".

CLEVIS GRAB AND SLIP HOOKS . . . These sturdy hooks are easily attached to any welded link chain. Pin and cotter make it easy to attach or remove for use on another job. Needs no connecting fittings or special tools.



Laughlin's new Catalog No. 180 lists the complete line of drop forged wire rope and chain fittings with illustrations, description and specifications. Write for it today.

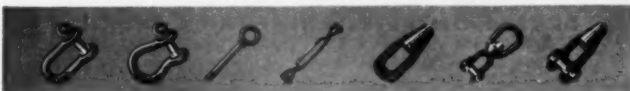


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manently injured. Such damage can be detected by examination of inside threads which will be broken in proportion to the overload.

Kinking is highly destructive to rope. It may cause hidden damage that will result in failure when the rope is again put under strain. Kinking is more likely to occur when rope is wet.

New ropes should be uncoiled by laying the coil on the floor with inside end down; then reach down through the center of the coil and pull this end up, unwinding the coil counter-clockwise. If the rope uncoils in the wrong direction, the coil should be turned over and the end pulled out on the other side.

Sometimes ropes become kinked after use. One method of removing these kinks is to open up the coil and recoil left-handedly. When the coil is completed, the free end is brought through the coil and the rope is then coiled right-handedly.

Uncoiling the rope and stretching it out in a single length is another method of unkinking where space permits.

Rope should be stored in a dry place where it will not be exposed to high temperature and where air may circulate through the coils.

Rope deteriorates very quickly if it becomes saturated with water and is not properly dried. Alternate wetting and drying will also cause rapid deterioration.

Handling Material Principles

Handle materials in large units. A two-wheel hand truck is better than a man's hands. A four- or six-wheel hand truck is better than either. A lift-truck pallet combination is the most efficient system for many jobs.

Avoid rehandling. Every time you pick up materials and put them down again, it costs money and offers opportunities for accident. Arrange your system to handle goods as little as possible.

Balance men and equipment. Assign no more men and no more equipment to a job than needed. Equipment sets the pace for men, not men for equipment.

Select equipment suited to the job. Study operations. Find out exactly what equipment is needed and standardize on that. The nature of facilities, floor load capacity, ceiling height, volume of material to be handled, intermittent or steady flow, commodity characteristics, and strength for package all have to be considered.

Move materials in a straight line. Flow of materials should always be toward destination. Lay out work areas so that back and cross hauling are held to a minimum.

In storage, items with greatest activity should be warehoused nearest to entrances and exits.

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None better . . . after 20 years still America's First and Safest

Men who buy and use sling chains are influenced only by facts gained through experience. HERC-ALLOY Sling Chain preference by Safety Directors and Production Executives has been built up over the years not by what we claim, but by what HERC-ALLOY has done on the job.

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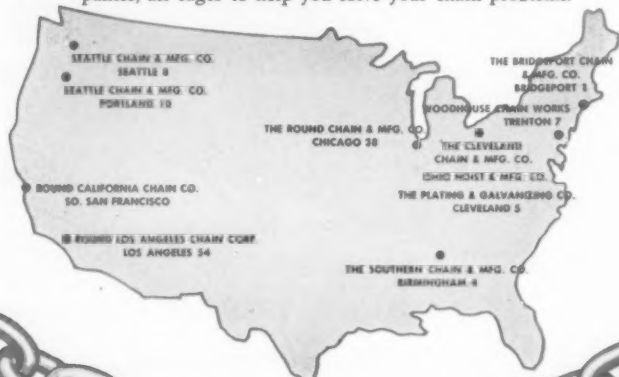
THE BRIDGEPORT CHAIN & MFG. CO.

Founded in 1887. Pioneered in Triumph (Lockweave) Pattern and other types of weldless chain. Pattern associated with the Round group in 1928. Plant modernization program undertaken several years ago is now nearing completion.

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The nationwide Round organization is made up of many men like Frank Diel and his associates . . . experienced, capable chain men who are respected throughout the industry. Practical chain men have been at the head of each Round firm since the first of the companies was founded in 1869. Today there are ten Round Chain Companies, all eager to help you solve your chain problems.



Modern Handling Methods

—From page 147

removal and should wear goggles and leather palm gloves for the work. Equipment available from suppliers should be used for applying and removing strapping.

Industrial Trucks and Tractors

Wheeled vehicles of many kinds, both hand and power operated, keep goods moving in factories, warehouses, docks and railroad terminals. There are types for every hauling or lifting job.

Wheelbarrows are useful for hauling and dumping bulk materials. They can be used where a two- or four-wheeled vehicle could not be maneuvered. Bodies of aluminum and magnesium alloys and rubber tires have made them lighter and easier to handle.

Hand trucks. The two-wheeler, designed for handling bags, drums, barrels, cartons, beverage cases, etc., comes in a variety of sizes and types. It can be equipped with brakes.

Hand platform trucks are available in several designs with capacities for 150 to 2,000 pounds. They are usually designed to be pushed by one of the end racks. They are suitable for short hauls.

MERRILL MATERIALS HANDLING DEVICES

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Hand lift trucks. The load, supported on platforms or skids, is raised enough for horizontal movement and pulled by hand power. These are useful where loads are relatively light and distances short.

Power Trucks

Power units for moving materials are operated by gasoline engine or storage battery. The type of truck used should comply with fire protection regulations for the location.

Powered hand truck. Similar to hand lift truck. Power for operation is supplied by storage battery. A motor mounted on the forward wheels supplies power for hauling. The truck is controlled by a walking operator.

Platform truck. Used for hauling baggage, mail, and packages at railroad stations and steamship piers. In industry it is used for hauling tote boxes and miscellaneous materials. Loading is by hand.

Low-lift platform truck. Platform elevates just enough for horizontal movement. It picks up loaded skids, moves and sets them down in other locations without manual handling or use of other handling equipment.

High-lift truck. A load carrying truck, with lifting mechanism designed to permit tiering one load



Knot It! Kink It! ...IT WON'T HURT A Tuffy SLING!



Patent No. 2,454,417

Get your FREE Tuffy 3-ft. sample sling and see for yourself how Tuffy's patented braided wire fabric makes an extra flexible sling. Tie it in knots, kink it, then see how easily it is straightened without damaging it in any way.

The reason is Tuffy's unique construction. (See enlarged photograph). Scores of wires are stranded into 9 parts, then machine woven into a wire fabric that has unusual flexibility and strength. Even cutting one of the 9 parts will not cause stranding.

11 Types of Tuffy Slings Available

There's a Tuffy Sling for *your* needs. If not, Union Wire Rope engineers will help work out special slings. Each one is proof-tested to twice its safe working load and the safe working load is stamped on metal tag attached to each sling. If you have your own rigging loft, Tuffy fabric is available by the reel.

MAIL COUPON FOR YOUR FREE SLING

See for yourself that all the things we claim for Tuffy Slings are true. A free 3-foot sample is yours for the asking. Just mail the coupon and your Union fieldman will deliver yours to you.



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upon another. Brakes give operator control of lifting device and platform at all elevations.

Fork truck. A cantilever type self-loading truck with vertical uprights and elevating mechanism. Forks require less clearance than platforms and may be used with shallow pallets as well as skids. Double faced pallets afford wider load distribution, which is an advantage in tiering.

Canopy guards. Where fork truck operators are exposed to danger from falling objects, the truck is required by code to be equipped with a canopy guard, strong enough to support a capacity load and have no opening larger than the smallest package carried.

Scoop trucks shovel loose materials and elevate and dump them into hoppers or bins.

Ram trucks handle wire and strip metal in large coils. Roll-handling trucks for handling newsprint or other paper are equipped with a cable drum with two cables. Hooks on the cables hook over the ends of a rod which serves as an axle for the roll.

Crane trucks equipped with boom, cable and drum, with special lifting hooks, spreaders and slings are used for moving heavy unit loads and objects too large to be handled on truck platforms or forks.

Portable elevators (tiering machines or stackers). The portable elevator consists of an upright frame to which is mounted a platform that can be raised or lowered. It is moved from place to place manually. The hoisting mechanism can be either manually or power operated.

Portable elevators are used in warehouses for piling and storing materials. They should be equipped with a braking device to permit the safe lowering of the platform and a ratchet lock or dog should be provided to lock the platform in position during loading and unloading.

Safeguards include limit stops for top and bottom travel limits on the hoisting cable drum, as well as for the shipper rope, if one is provided. When in use, casters should be lifted off the floor.

Tractors and trailers are used where large quantities of materials must be moved over relatively long distances, as at freight terminals and piers. Loading and unloading is done manually or by crane or other external means.

Conveyors

Where material moves in continuous flow, power-operated and gravity conveyors eliminate much handling and many opportunities for injury. Principal types are roller, chute, belt, chain, portable, screw, pneumatic, monorail and overhead trolley.

Cut materials handling costs with
MAGCOA
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Magcoa Magnesium Dockboards are proving the perfect answer to freight car and truck loading problems in every type of industry. One man can position it without the aid of truck, chain or hoist because it weighs $\frac{1}{4}$ as much as steel ramps of equal size and strength. Hand holds in each corner of the special quarter round safety curb permits ease of handling. Beveled edges and bend angle keeps Dockboard flush with floor and dock. Slipping out of position is impossible due to safety span designed to application requirements. Put completely modern Magcoa Dockboards to work for you... they'll take the load out of your earloading operations.

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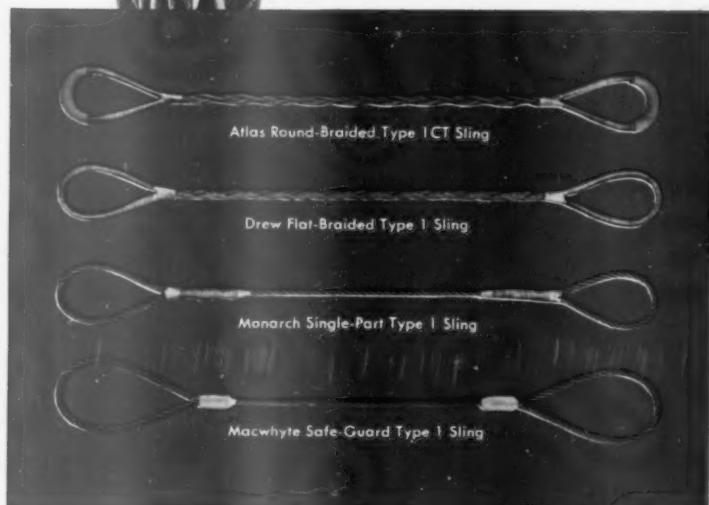
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Macwhyte Slings

Here are four of the hundreds of slings pictured and listed in the newest Macwhyte Sling Catalog. All these slings are made to order in any size with fittings needed for your job. All three types of body are available; round-braided, flat-braided, single-part. Macwhyte has worked with hundreds of sling users toward more efficient materials handling. Our engineers are ready to study your sling needs and make recommendations.

For cranes and hoists specify PREformed Monarch Whyte Strand Crane Rope made by Macwhyte.

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Can YOU Do This?

• Do your slings give maximum safety in handling the 101 odd loads that your crane moves daily? A combination of ACCO Registered Wire Rope Slings, as shown above, can be used safely because all fittings and attachments have full rope strength.

The DUALOC Ending produces the strongest wire rope sling made. Two collars insure uniform strength from sling to sling. Actual strength certified by warranty certificate. Preformed improved plow steel Green Strand wire rope with steel core assures maximum resistance to kinking.

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New York, Odessa, Tex., Philadelphia, Pittsburgh,
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**Wire Rope
Slings**

Gravity conveyors are of two general types—chute and roller.

For efficient and economical operation fixed systems require thorough study of the plant's manufacturing and material handling problems.

Power-driven conveyors should be equipped with emergency stopping devices located at convenient points.

Crossover bridges with adequate handrails should be placed where needed. Side boards along edges and at turns of overhead conveyors and screen guards underneath high runs protect workers from falling material.

Portable conveyors, power-driven or gravity, mounted on casters or wheels, can be moved where needed for short jobs. These are made in roller, belt and bucket types for handling packages and loose material. They are often used at warehouses, docks, shipping platforms, coal yards, and sand and gravel pits.

Portable floor cranes or hoists are mounted on wheels that can be moved from place to place, either by hand power or under their own power. These raise and lower loads in a vertical line. They will not rotate around a fixed point.

Portable cranes are useful in plants where overhead belting, shafting, etc., prevent the use of overhead cranes, and where service is not frequent enough to justify more expensive equipment. The lifting mechanism usually consists either of a winch with wire rope and block, or a chain hoist, operated by hand or by electric power.

Hoists operated by electric power should be effectively grounded to prevent shock in case of short circuit.

Jib cranes can lift, lower and rotate a load within the scope of the circle covered by a rotating arm or jib upon which runs a trolley. The jib is usually supported from a wall or column. A hoist, hand-operated air or electric, is suspended from the trolley. A substantial stop at the end of the jib arm prevents the trolley running off.

Hoists

A hoist is a mechanical device, suspended from overhead, used for raising or lowering loads through a vertical plane. Common types of hoisting apparatus include:

1. Block and tackle
2. Hand chain hoist
3. Electric hoist
4. Air-operated hoist

Block and tackle. Blocks threaded with fiber or wire rope are used for suspending scaffolds, raising objects, and other industrial purposes. When used to lift heavy materials or to hold loads suspended, as on heavy duty scaffolds, wire rope should be used.

Hand chain hoists may be used where overhead cranes cannot be installed on account of lack of head room. They also handle heavy pieces at machines. One hoist may handle the work at one or more machines.

Steel is recommended for load-sustaining parts. It will withstand sudden shock better than cast iron and is much lighter in weight for equal strength. Chain should be of best quality steel and should be welded.

Each hoist should be equipped with a braking device which automatically locks the load when hoisting is stopped.

Chains and sheaves should be lubricated at intervals, depending on atmospheric conditions.

Electric hoists range in capacity from $\frac{1}{4}$ ton to 20 tons. They are faster than hand hoists and less fatiguing for large loads. The light duty hoist uses link chain for lifting. The heavy duty type uses wire rope.

Limit stops prevent the hoist from traveling too far in case the operating handle is not released in time.

Air hoists operate on compressed air. They are used where sparks from electric equipment might be a hazard, or where smoothness of operation is important. The air hoist is limited in travel because of dependence on the air lines.

Grabs, grips and tongs of several types have been developed for use with overhead handling equipment, such as cranes, monorails, hoists, etc. Some can handle a variety of objects while others are highly specialized.

Wire Rope

—From page 149

11. Kinking.
12. Severe overloads, reverse bends, and other excessive stresses.
13. Internal wear caused by grit penetrating between strands and wires.

How to Order

When ordering wire rope, the following information should be furnished:

1. Length.
2. Diameter.
3. Construction — Number of strands; Number of wires per strand; Arrangement of wires in strand, such as Seale, Filler Wire, etc.
4. Type of Fabrication — If pre-formed rope is desired, it should be specified. Otherwise, non-pre-formed rope will be furnished.
5. Finish — Galvanized finish should be specified if required. Otherwise bright rope is usually furnished.
6. Grade — Improved plow steel, Plow Steel, Iron, etc.
7. Lay — Regular Lay Right Lay will be furnished unless otherwise



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(Patent Pending)



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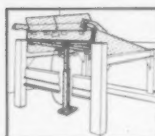
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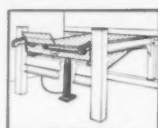
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BUCKETS—1, 3 and 5 gallon. Small top on five gallon to minimize splash.

DIPPERS—1 pint, 1 and 2 quart with convenient safety pouring handle.

MEASURES—1 pint and 1, 2, 4 and 6 quart with pouring lips and convenient curved tipping handles.

FUNNEL—10" diameter; handle and eye.

CLOSED TYPE CONTAINER—1, 3, and 5 gallon. For safe transporting of solutions without danger of splashing or spilling.

LONG SPOUT CONTAINER—5 gallon. 14 inch curved pouring spout, hood, tipping handle. Protects employee where reaction is expected.

The safest utensils made for handling acids, alkalis, and other corrosive solutions. Perforated steel core, all-welded construction. Seamless rubber coating—inside and out. No metal exposed. Rubber welded through perforations presents separation from metal.



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specified. If Lang Lay or Left Lay is wanted it must be specified.

8. Core—Specify fiber core, independent wire rope core, or wire strand core.

9. Lubrication—Type of lubricant should not be specified unless there are unusual service requirements. Each construction and grade of rope is treated with a lubricant adapted to that particular rope for a wide range of service conditions.

10. Use for which rope is intended.

Timber Storage

(Forest Products Laboratory)

SERIOUS losses from decay in wooden structures are due to infection of timbers with wood-destroying fungi while in storage. These losses can be greatly reduced by keeping lumber storage yards in a sanitary condition. Following are some hints:

Store on well-drained ground, removed from possible dangers of floods and standing water.

Remove debris and keep down weeds. All rotting debris scattered about yards should be collected and burned. In yards already filled in to

considerable depths with sawdust and other woody debris the situation can be improved by a heavy surfacing with soil, slag, or similar material. Weeds should be cut away from piles to allow ventilation.

Use proper foundations. More attention should be given to the foundation of lumber piles to provide better ventilation beneath stacks. Solid foundations should never be used. In humid regions stock should never be piled less than 18 to 24 inches from the ground.

Wood blocking used in direct contact with wet ground should be protected by application of creosote or other germicidal oils or else replaced by concrete, brick, or other durable materials. Treated skid timbers would also be advantageous.

Slope lumber piles. Foundations should be built so that the piles will slope approximately 1 inch to every foot of length.

Assist ventilation by avoiding close piling in the open. In most regions lumber should not be close piled in the open, but should be "stuck" with crossers at least 1 inch thick. Lateral spacing is also desirable. Roofing of cover boards on the piles should extend over for several inches in front and back.

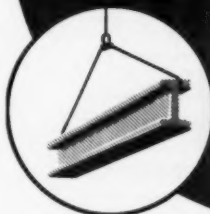
Take care of "stickers." Instead of throwing the "stickers" about on the ground to become infected with decay, they should be handled carefully and when not in use piled on sound foundations and kept as dry as possible. If pine saturated with resin, or heartwood of such durable species as white oak or red gum is employed, danger of infection is greatly decreased.

Keep sheds dry and well aired. In storage sheds the necessity for piling higher from the ground is very apparent in many cases. The same remedies apply here as for pile foundations in the open. Sheds should be tightly roofed and siding should not be run down below the bottom of the foundation sills. Free air circulation should be allowed from all sides beneath enclosures. Only thoroughly dry stock should be stored in close piles under cover.

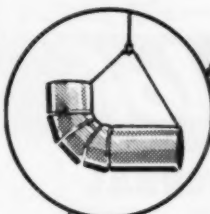
Check fungous outbreaks. Should fungous outbreaks occur in storage sheds not constructed to meet sanitary needs, the infected foundation timbers should all be torn out and replaced with wood soaked in a germicidal solution or by concrete or brick. In all cases new foundations should be constructed to keep lumber well off the ground, and soil and timber adjacent to the infected area should be sprayed or painted with a germicidal solution of a water-soluble salt, such as sodium fluoride, mercuric chloride, zinc chloride, or copper sulphate.

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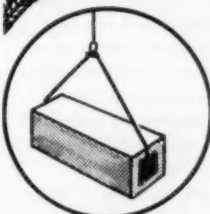
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Lubrication

MODERN MACHINES operate at high speeds on countless bearings which need proper lubrication at frequent intervals. New lubricants and new lubricating systems had to be developed to meet industry's needs.

Lack of lubrication contributes to the danger of fire or machine failure by causing excessive heat or damage to the surfaces of moving parts.

Automatic lubrication is safer and more efficient than direct application of oil or grease to bearings by use of an oil can or grease gun.

Automatic oilers are of the following types:

- Capillary oilers
- Wick oilers
- Ring and chain oilers
- Gravity feed oilers
- Pump feed oilers
- Cartridge lubricators

Machines with hundreds of remote bearings can be served efficiently and economically by centralized systems. Clean oil or grease is supplied under pressure from the central pumping unit to every bearing.

The lubricant is renewed as often as the machine and operation require, which may be once or twice each shift or several times an hour.

On some systems an indicator signals the delivery of the correct amount of oil to each bearing.

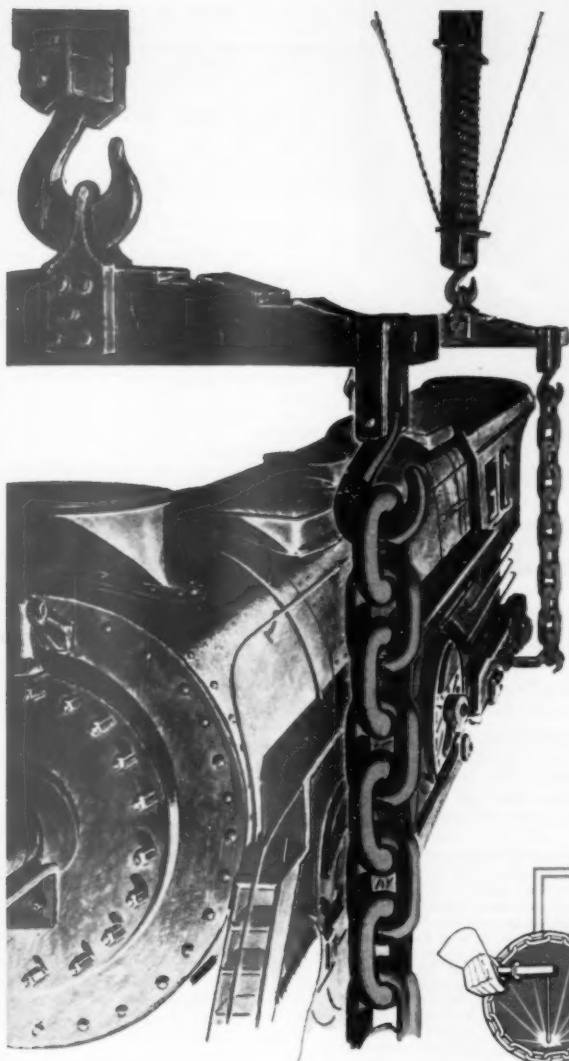
With a central pressure system there is no need to stop the machine for lubrication and the hazardous job of crawling over the machines is eliminated.

Pressure lubrication systems require the use of special greases. No single lubricant has been found best for all types of machines.

For Older Installations

On older machines addition of an automatic system may not be practical. Other measures will help to improve lubrication and reduce the hazard to the oiler. One or more of these methods may be used for reaching remote bearings:

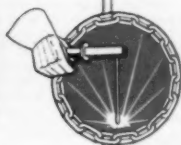
1. A service platform or runway giving access to several bearings. Moving parts of machinery should not project over platforms; if this is unavoidable, these parts should be enclosed.
2. A small car suspended from an overhead I-beam enables the oiler to travel parallel to the line shaft, and reach bearings with his oil can or grease gun.
3. Long-spout gravity flow or forced oil cans enable the oiler to stand in the clear. Some of these have spouts long enough to reach overhead line shaft bearings from the floor.
4. Oil reservoirs at individual bearings with control devices operated by hand poles.



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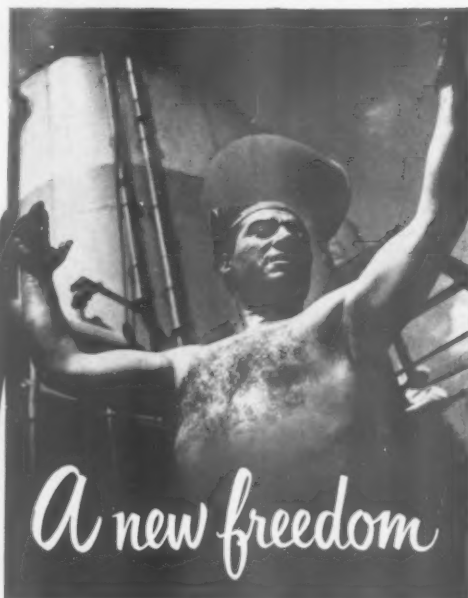
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smile... a Freedom
from heavy burdens
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from beastly toil...
a Freedom from
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Freedom from waste
and spoil... It is a
Freedom brought by
Machines... and
by Methods created
by Men who engineer
history for the greatest
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These Clark publications will help you and your workmen to enjoy the many benefits of this New Freedom. Any one—or all—of them will be sent to you upon request.



5. Extension pipes on bearings where grease or oil cups are in the danger zone. These may not be practical in cold places where low temperatures make it difficult to force oil or grease through the pipes.

Wire Rope Lubrication

All wire rope should be treated at regular intervals with a lubricant to keep pliable and to prevent rust. Pound for pound, wire rope probably has more bearing surface (inside the rope) than any other equipment, so the importance of lubricating is obvious.

Idle wire ropes are most susceptible to damage by rust. It is important to see that they are well lubricated when not in service.

The best lubricants are those furnished by manufacturers and dealers especially for lubricating wire rope.

Lubricants which meet specifications are free from acids and corrosives and have good penetrating qualities. They do not cake, gum or ball-up if contaminated with dirt or metal particles.

Lubricant may be applied with a brush. It should be brushed on slowly, carefully and frequently because it is difficult to get complete coverage and penetration.

A more effective method is a simple three-sheave trough. It should be firmly fixed near the reel or drum and the rope run through the lubricant not faster than 30 feet a minute.

Acid Handling

Acids, alkalies and other corrosives require a variety of specialized handling apparatus. Devices include buckets, dippers, funnels, pitchers, pumps and carboy inclinators.

Bags for carrying bottles of corrosive liquids lessen the risk of accidental breakage. The bag is of padded impermeable, acid-resistant material.

Materials used for equipment include rubber (natural and synthetic), stainless steel, and certain types of plastic. These materials are of many types which differ quite widely in their resistance to corrosives.

Crossover Bridges

Where loading docks are separated by railroad tracks, crossover bridges are needed. Some are of the draw-bridge type; others are mounted on four pillars that can be raised or lowered quickly by push-button control.

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Sales executive with management background who knows and thoroughly understands selling the institutional field (hotels, hospitals, public institutions, restaurants) to direct institutional sales for large, well-known manufacturer of sanitation chemicals. Write in full confidence, giving detailed experience, past earnings and income desired. Address Box 483, NATIONAL SAFETY NEWS. Appointment will be arranged.

SECTION 6

Machine Operation and Guarding

Guarding the Machine

MACHINERY is involved in approximately one-fifth of all compensated occupational injuries in manufacturing industries. More significant is the fact that 25 per cent of all permanent disabilities result from machinery accidents.

Among machines which figure frequently in accidents are power presses and woodworking machines, such as circular saws, jointers and planers.

The majority of machine accidents occur at the point of operation, although not always during the normal operation of the machine.

Much attention has been given to machine guarding and many effective safeguards have been developed. However, there are many types of machines used in industry and a great variety of operations performed on these machines. This, and the fact that human beings frequently do unexpected things, often makes positive protection extremely difficult.

Many machines are quite safe for normal operation. It is quite unnecessary for an operator to place his hands in the danger zone but sometimes it is done. Guarding, therefore, must be planned to protect the individual against his own lapses as well as against the normal hazards of the job.

Many machines are now equipped with guards built in by the manufacturer. This is in keeping with modern streamlining. Such guards are usually more efficient as well as better looking.

REFERENCES

- Machine Operation**
Construction of Machinery Guards—Safe Practices Pamphlet 58, NSC.
Inspection and Maintenance of Power Presses—Data Sheet D-Me 18, NSC.
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Press Brakes—Data Sheet D-Me 28, NSC.
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Punch Presses Can Be Guarded, by R. L. Thuma—N. S. News, Jan. 1950, p. 24.
Taming the Saw, by L. H. Reineke—N. S. News, July 1950, p. 24.
Polling Friction, by W. E. Montgomery—N. S. News, May 1950, p. 32.
Central Lubrication Cuts Cost and Hazard—N. S. News, Dec. 1951, p. 74.

Color is a safeguard. Highlighting the point of operation with light tints which stand out against the darker background of the machine enables the operator to watch the work with less effort on the eyes. Strong colors which give warning when a guard is missing are also helpful.

Where built-in guards are not practicable, as in the case of older machines, or machines requiring special guards, standard types of commercially available guards are recommended. Standard guards for such machines as power presses, circular saws, paper cutters, and others, are designed to fit most sizes and styles of machines.

A guard which interferes seriously with output is not likely to be popular with either the operator or the management. Planning a guard, therefore, should be done in cooperation with the supervisor and the operator.

Guard design must often be approved by state factory inspectors and insurance engineers. Since state codes are not uniform and at best represent only minimum requirements, the codes and recommendations of the American Standards Association are the best guides.

Point-of-Operation

Guarding the point of operation effectively is usually more complicated than enclosing power-transmission apparatus.

Point-of-operation guards are installed at those parts of machines where cutting, shaping or forming is performed, and at other points where there may be a hazard to operators inserting or manipulating stock.

Guards should protect operators both from moving machine parts and from moving materials. This may be done by safeguards of the following types:

1. Mechanical feeding and ejecting devices.
2. Two-hand control devices.
3. Redesign of machine parts so that it is impossible for the operator to get into the danger zone.
4. Devices that interrupt movement of tools or machines, while any part of the body is in the danger zone.

MECHANICAL APPARATUS INSPECTION

Check the points listed below. Make recommendations to cover unsatisfactory conditions so that they can be corrected promptly.

POWER TRANSMISSION ENCLOSURES OR GUARD RAILS


- | | |
|--|--------------------------|
| Pulleys, flywheels | <input type="checkbox"/> |
| Gears, sprockets, chains | <input type="checkbox"/> |
| Belts: vertical, horizontal | <input type="checkbox"/> |
| overhead horizontal | <input type="checkbox"/> |
| Belt shifters | <input type="checkbox"/> |
| Keys, set screws, collars, couplings | <input type="checkbox"/> |
| Shafting | <input type="checkbox"/> |
| Clutches | <input type="checkbox"/> |
| Lubrication facilities | <input type="checkbox"/> |

CONTROLS

- | | |
|--|--------------------------|
| Electrical starting devices | <input type="checkbox"/> |
| Lockout devices | <input type="checkbox"/> |
| Tripping devices: foot, hand | <input type="checkbox"/> |

POINT OF OPERATION GUARDS

- | | |
|----------------------------------|--------------------------|
| In place | <input type="checkbox"/> |
| Condition satisfactory | <input type="checkbox"/> |
| Correct adjustment | <input type="checkbox"/> |

 SAFETY INSTRUCTION CARD No. 778
National Safety Council PRINTED IN U.S.A.

5. Devices that pull or push the operator's hands away from the danger zone.

6. Barricades, covers, hood guards and other enclosures.

7. Interlocking devices.

Power Presses. Automatic feeding and ejecting devices, enclosure guards, sweep guards, hand or arm "pull-back" guards, and stroke limitation, are among the means used to control the hazard of operation.

Few types of guards provide 100 per cent protection. For instance, an automatic or dial feed may make it unnecessary, but not impossible for an operator to place his hands in the danger zone. But frequently an operator cannot resist the impulse to straighten a misplaced part just before it passes under the ram.

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Electric Equipment

ELECTRICITY has contributed much to modern industry in efficiency, cleanliness and safety.

The flexibility of electric power permits installation of motors on individual machines, or for driving groups of machines. This makes it possible to dispense with shafting, belts and other transmission equipment which require extensive guarding and interfere with light, ventilation and housekeeping.

Installation, maintenance and use of electric equipment have introduced new hazards but these are well known and effective control measures can be applied.

Rules for the use of electric equipment are given in numerous publications, including the **National Electrical Safety Code**, which deals with prevention of injuries, and the **National Electrical Code**, which deals with fire protection.

Electrical equipment which bears the approval label of recognized testing laboratories has passed exacting tests and can be used with confidence.

Installation. All electrical work should comply with applicable codes.

Transformers, control boards, starting rheostats, and other apparatus should be placed where there is the least danger of accidental contact with energized conductors. All exposed current-carrying parts should be further protected by enclosures, railings or special guards.

Motors should be mounted so as not to interfere with normal plant traffic. Non-enclosed type motors should be located in areas relatively free from dust, moisture, or corrosive vapors.

Isolating equipment. When practicable, transformers, control boards and other accessories should be placed in special rooms to which only authorized persons have access.



Fiber fuse pullers should be used when replacing fuses.

If a separate room is not feasible, enclosures should be built around equipment having exposed conductors. Enclosures made of metal should be effectively grounded.

Barriers may be used to prevent accidental contact with electrical equipment. Frames may be made of wood, rolled metal shapes, angle iron or pipe. Filler may be of woodstrips, sheet metal, perforated metal, expanded metal, wire mesh, or shatter-proof transparent material.

Some protection can be obtained by elevating wires and current-carrying parts at least eight feet above any working level to which employees (other than qualified electricians) have access.

Where long metal parts, such as rods, bars and pipes are handled, partial enclosures or barriers should be provided to prevent contact with overhead electrical installations.

Warning signs should be displayed near exposed current-carrying parts, especially high-voltage installations.

Many standard machine-guarding practices apply to electric equipment, but there are certain hazards peculiar to electricity. Particular attention should be given to the **National Electrical Safety Code** and the **National Electrical Code**.

Protective grounding is necessary for exposed non-current-carrying metal parts if the equipment is supplied by means of metal-clad wiring, when installed in a wet location, and when it operates with any terminal at more than 150 volts to ground. Parts to be grounded include motor frames, cranes, cases of transformers and oil switches, wiring conduit, and metal lamp sockets.

Frames of all portable motors which operate at more than 50 volts to ground should be grounded.

Motors should be of the type and size required for the load and for conditions under which they must operate. Overloading over long periods, use of non-approved motors in areas containing flammable vapors or dusts, and defective wiring should be avoided.

Motor windings should be protected from metal particles, dirt, dust, lint or other material which may damage the windings or become ignited. In areas containing flammable dust and gases, motors designed for hazardous locations should be installed. The **National Electrical Code** should be followed.

Grounded metal enclosures are recommended for starting rheostats, switches, fuse panels, and other operating accessories. In some devices, both switch and fuses are enclosed in a cabinet so arranged that the switch can be operated without opening the cabinet. The switch is interlocked

through a cam so that the fuses are inaccessible until the switch is opened.

Another type of enclosed switch permits the door of the cabinet to be opened with a key, even though the switch is closed. With either type of cabinet, it is possible to padlock the door open or closed, and the switch can be padlocked in the open position.

Maintenance and repair work. When repair work is being done on motors, their controlling devices, or the machinery they drive, the circuit should be de-energized by opening the necessary switches and locking them in the open position.

If a switch cannot be locked open, it should be blocked and a tag attached showing that the switch is to be closed only by the man whose name appears on the tag. Warning signs should be displayed.

Wiring depends upon type of building construction, size and distribution of electrical load, exposure to dampness or corrosive vapors, location of equipment, and other factors. For most plant conditions, rigid metal conduit, effectively grounded, is satisfactory.

Other methods which may be used under certain circumstances include armored cable, non-metallic sheathed cable, flexible metal conduit (BX), raceways, and open wiring on insulators. National and local wiring codes should always be observed.

Over-Current Devices

Fuses or circuit breakers should be installed in every circuit. Protection of this kind, both for personnel and for equipment, is important. These devices open the circuit automatically in the event of excessive current flow due to accidental ground, short circuit, or overload.

Types of fuses include:

A link fuse is a strip of fusible metal between two terminals of a fuse block. If exposed, it may scatter hot metal when it blows.

Expulsion fuses are used in central stations, power houses or on overhead lines. When they blow, the gases generated aid in quenching the arc.

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Electricity

National Electrical Code, C1-1946—American Standards Assn. (Natl. Board of Fire Underwriters Pamphlet No. 70.)

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Your Electric Equipment, by D. L. Beeman—N. S. News, Nov. 1948, p. 24.

Electricity and the Human Body, by W. B. Kouwenhoven—N. S. News, Feb. 1951, p. 30.

Ampco's all-purpose bung wrench fits 17 different closures. It's the ideal safety tool for opening drums of gasoline and dozens of other inflammable materials.

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...Ampco Safety Tools for every job where a spark spells disaster

For hazardous locations, a few dollars invested in the right Ampco tool can prevent thousands of dollars worth of property damage — lost time and lost lives!

That's why Factory Mutual Laboratories and other safety authorities approve and recommend Ampco Safety Tools. Select the right tool for every job from the more than 400 individual items that make Ampco the world's most complete line of safety tools. Enjoy lower insurance rates — and plant-wide peace of mind that builds greater job efficiency!

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For tools subject to impact and/or torque — specify tools of Ampco Metal.



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For tools with cutting edges and gripping teeth — Ampco beryllium copper.

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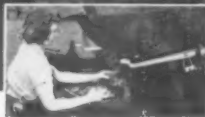
SAFETY without Sacrifice of Speed!

BENJAMIN POWER PRESS DEVICES



1. Operator places work on die with one hand, removing finished part with other. Note clear working space, permitting faster production.

2. Operator places both hands on safety device handles; this trips press and assures that hands are out of danger zone when ram descends.



3. Operator removes finished part, places next part in position for next stroke. An easy natural routine permitting top speed.



Years of successful safety experience prove the merit of these devices, prove that safety can be achieved without sacrifice of speed in power press operation. The booklet illustrated at the left describes these three devices:

BENJAMIN PUNCH PRESS SAFETY DEVICE

*Keeps Hands out of Harm's Way . . .
Eliminates Foot Treadle . . . Speeds
Output . . . Inexpensive!*

This device eliminates the possibility of accidentally tripping the press while hands are in the way by making it necessary for the operator to use both hands to trip the press! In successful use for over 30 years on practically every make, size and type of press. Introduces no new mental or physical hazards, makes safety a part of the working cycle, eliminating lost motion. Imparts sense of security which enables operator to speed output. Conserves die-setters time because it does not have to be removed or adjusted. All punch press manufacturers will install them on presses ordered or you can order direct and make installation yourself. Underwriters' Laboratories approved.



Send for this Free Manual. Shows hundreds of manufacturers, large and small, are utilizing Benjamin Safety Devices to help increase safety and improve production. In this manual are contained complete details, installation instructions, diagrams, and how-to-order information.

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Increase Output by utilizing Compressed air to Automatically Eject Stampings, Blow Out Chips, etc.

These ejectors are specifically designed for releasing an accurately timed blast of air of correct volume and intensity for ejecting stampings, blowing out chips, scale, etc. The set consists of the valve, trip and hose. Can be installed on any size or type of press and any machine on which there is a suitable reciprocating or rotating motion for actuating the valve. Operates from your regular compressed air line or by means of the

BENJAMIN UNIT COMPRESSOR

This air compressor is attached to the side of the press or machine and utilizing the action of the press compresses the air required for operation of the Benjamin Ejector. It provides an economical solution to the problem of obtaining a compressed air supply where there is no existing compressed air system. Use of this device is desirable also, where expensive dies are used and in other operations requiring moisture-free air supply. Being self-contained, this device eliminates the possibility of moisture in the air which often develops in long air lines.

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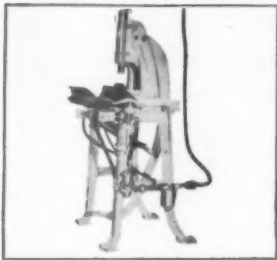
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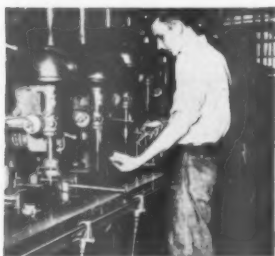
Airways to Greater Safety via Schrader®



Air Ejection Sets—can increase safety of hand fed machines 50%. The combination of Schrader Air Ejection Sets and Schrader Power Press Controls can make the machine practically foolproof.



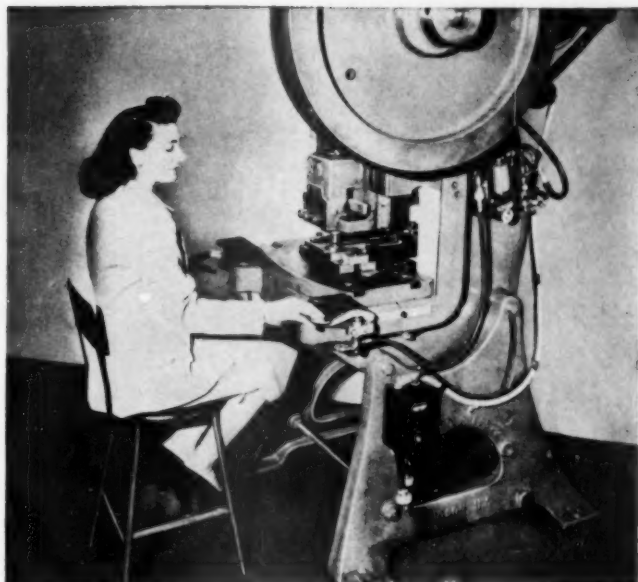
Kick Press Controls—eliminate fatigue by substituting more efficient air power for foot power. There is a Schrader pneumatic control for hand operation, foot operation or both.



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Air Cylinders • Operating Valves •
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PRODUCTS
CONTROL THE AIR



Keep hands out of danger zone with this **TWO HAND** press control

Control becomes inoperative when either hand operating valve is tied down

Here is a power press control that is definitely a two-hand device. A special cutout valve eliminates the possibility of tying down either hand operating valve to obtain one-hand operation.

After the work is placed in the machine the operator must depress both hand operating levers at the same time for the machine to operate. This means that the hands, both of them, must move out of the danger zone in order to operate the levers.

No longer is it necessary to resort to

mechanical monstrosities to make power press operation safer. And with the Schrader Control no effort is necessary to operate the levers. A light touch does the work.

Wherever there is a power press, there is an opportunity to increase safety by installing a Schrader Control.

Ask us to help you determine what will best fit your needs. Send us a letter outlining your particular installation requirement, your idea, or fill out the coupon below.

Variations of this control can be applied to most any type machine for greater safety, and increased production.

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**Open & Close
Instantly**

**WHETHER OPERATION
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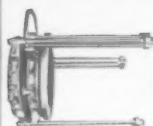
MECHANICAL

THERMAL EXPANSION TYPE

Steam passing through steel tubes causes linear expansion sufficient to free the goggle plate. When the steam is removed, normal cooling contracts the tubes, clamping the goggle plate with a gas-tight seal. In case of steam failure this type Bailey Valve can be operated mechanically.

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A powerful, hand-operated clamping device assures a positive, gas-tight seal around the entire periphery of the valve. The goggle plate is released and clamped by the same powerful mechanism.



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Made in diameters of
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60" x 48" Bailey
Valve for Horizontal
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Here is the means to instant service in shutting off gas mains in emergencies or for repairs . . . regardless of the length of time the valves stand unused. Soundly designed and built of the highest quality materials, Bailey Goggle Valves have repeatedly proved themselves dependable on gas washers, blast furnace mains, precipitators and boiler plants. With their positive, gas-tight seals, Bailey valves protect men and equipment, and assure economy through long, maintenance-free service.





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measures that give constant protection against the unthinking moment

Junkin Swinging Die Closure →

For all primary, or blanking, operations. Swing link mounting gives ready accessibility to dies. Split lock device disconnects pedal when guard not in full protective position. Splinter-proof plastic shield provides full view of dies. Complete unit, easily installed.

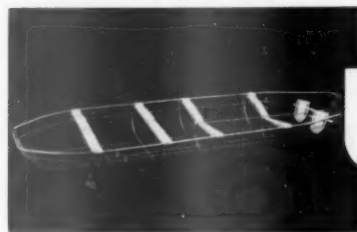


← Junkin Interlocking Barrier Guard

For secondary, or forming, operations. Features automatic reciprocating barrier gate, controlled by mechanical interlock. Press trips only when guard is in complete protective position. Non-repeat principle limits press to single stroke. Entirely automatic, universally adaptable, easily installed.

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When accidents do happen, transport victim in safest, easiest manner—in this rigid, lightweight stretcher. Construction permits patient to be carried horizontally or lifted vertically without danger. Canvas straps, footrests keep patient rigid and comfortable at any angle.

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Warren, Ohio

Hand and Power Tools

HAND TOOLS of various types are used in even the smallest shops. Since their use involves accidental contact with cutting edges or severe blows, they are responsible for numerous injuries on the job.

Estimates of the percentage of disabling injuries caused by hand tools range from 6 to 15. While many of the injuries involve only first-aid treatment, these slow down work and offer chances for infection.

Hazards are increased by selection of the wrong tools for the job, neglect of maintenance, and the idea that anybody can use them.

Portable power tools have the hazards of hand tools increased by high speed operation and more severe blows. With electric tools there is also the hazard of shock.

Types of Tools

Tools commonly used in industry are of the following general types:

- 1. Metal Cutting**—Cold chisels, marking tools, bull chisels, hack saws, tin snips, cutters.
- 2. Wood Cutting**—Chisels, gouges, saws, axes, adzes, hatchets, knives, Brad awls.
- 3. Lifting**—Levers, crowbars, jacks, hooks, shovels.
- 4. Torsion**—Wrenches of various types, pipe tongs, screwdrivers, pliers.
- 5. Striking**—Hammers, sledges, mauls, picks, punches.

Some tools belong in more than one classification. An ax, for example, is both a cutting and a striking tool.

Accident causes. One or more of four primary causes are responsible for injuries with hand tools. Following are examples:

- 1. A wrong or improvised tool**—a file or screwdriver for prying; a wrench for hammering.
- 2. A defective tool**—a burred chisel head; a dull saw or knife; a split maul handle; a tool of poor quality.
- 3. Tools incorrectly used**—striking two hard-surface tools together; failing to take practice swing with sledge to adjust for clearance; pulling on pliers in line with face.

—To page 174

REFERENCES

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Power-Actuated Hand Tools—Data Sheet D-Gen. 34, NSC.
Maintaining Electric Hand Tools, by John A. Hill—N. S. News, Feb. 1950, p. 30.
When You Use Portable Electric Tools, by B. B. Ramey—N. S. News, Apr. 1948, p. 20.

SAFETY MARKING TOOLS HELP PREVENT ACCIDENTS

• GIVE BETTER • PRECISION • LAST LONGER •



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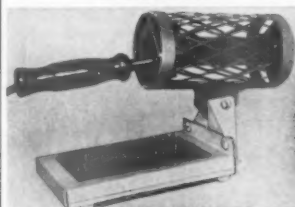
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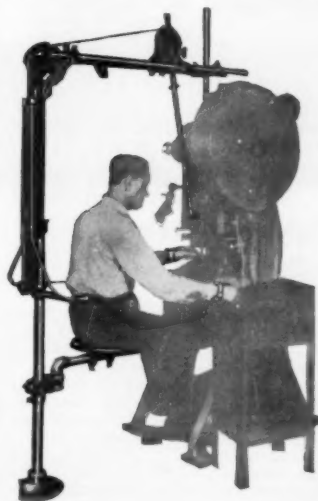
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AND IMPROVED
**POSSONS
POSITIVE
DEVICE**

assures
Positive Safety
Fast Production
Smooth Operation

A type for every kind of press. Meets all safety requirements. More than 25,000 in use; Write today for catalog and names of users near you.

THE POSITIVE SAFETY MFG. CO.
4403 Perkins Avenue, Cleveland 3, Ohio

Hand and Power Tools

—From page 172

4. Tools not put away—wood chisel loosely laid in tool box; hammer left on edge of machine; knife left on table.

Selection. Standard tools for routine and special work should be kept in stock or readily available. High grade tools are the best buy and the difference in initial cost is offset by longer life, reduced upkeep and lessened risk of accident.

Suitable arrangements should be made and responsibility placed for

the purchase, handling and care of tools. The purchasing department should be kept informed of tool performance as a guide to future purchases.

Alloy steels have strength and toughness combined with light weight which justifies the higher cost for some jobs. Alloys are used for hammers, wrenches, screwdrivers, wood working tools, pliers, rivet sets, saws, knives and punches.

Some alloys offer resistance to mushrooming, and chipping but no tool should be subjected to unnecessarily rough use.

Non-ferrous hammers or mallets

should be used for striking tempered or case-hardened tools. These hammers are usually made of copper, lead, bronze, brass, rawhide, or wood.

Handles. With hammers, sledges axes, picks, etc., the greatest strain is where wood and metal join. An adequate supply of good handles should be kept in the toolroom. These should be straight-grained wood, free from slivers. Hickory, ash and maple are preferred. Handles should be fitted by an experienced person.

Insulated tools. For working around electric equipment, tools with insulated handles are frequently used. These provide desirable protection but are not a substitute for rubber gloves and other protective devices.


Marking tools. Steel stamps and holders for stamping identification marks on machine parts and other metal surfaces are available in alloys which resist mushrooming and do not chip readily.

Car movers. For moving cars on rails, several types of car movers are available. These are safer and more efficient than crowbars.

The Tool Room


When enough tools are handled safety and efficiency result from installation of a tool crib with a competent attendant. In addition to routine

"SAFE...for SURE!"



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PERSONAL - SAFETY PADLOCK



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When a man locks his Corbin Personal-Safety Padlock on a switch or valve, he knows he's protected against its being prematurely turned on. No chance for accident... no risk of being a forgotten man! Each electrical repairman, boiler cleaner, etc. should have his own Corbin No. P65R Padlock. Made especially for safety purposes, they have a solid die cast case, a shackle-opening height of 2 3/4 inches, and an attached metal identification tag. Disc tumbler mechanism has 200 regular key changes and 700 possible changes when so required. Corbin P65R Padlocks can be keyed alike or master-keyed. We will gladly help you work out a Personal-Safety system based on your specific needs. For further information without obligation, write to:

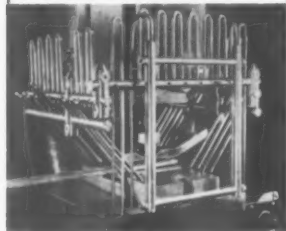


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SHUR-SAFETY Engineered Punch Press GUARDS

Are designed to fit your press and your needs. SHUR-SAFETY means extra protection and higher production because SHUR-SAFETY guards are made to the specifications of your machine.



The New Laminated Glass Front Is Also Available

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Write for information

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checking in and out, the attendant can see that workers obtaining such tools as mauls, cold cutters and drills also have eye protection for the job.

Tools showing signs of abuse on return can be brought to the foreman's attention so that bad practices by users can be corrected.

Display boards are often used for maintenance and repair tools and do much to encourage return of tools. In other plants, racks or bins which can be moved to the work area are used. These require periodic checking to see that tools are in good repair.

An individual workman's tools should be kept in a box or rack convenient to his work area. The box should have designated places for such things as wire brushes, chisels, saws and knives to avoid exposing sharp edges.

Inspection. Permissible wear limits for tools should be set up as a guide for inspection when they are returned to the crib. Lacking such standards, the attendant or inspector should be qualified to pass on the condition of the tool for future use.

Periodic inspections of all tool operations are needed to insure efficient control. Inspections should include housekeeping in the tool crib, tool service, number of tools in the inventory, handling procedure, and condition of tools in general.

Maintenance and repair require adequate facilities, such as work benches, vices, forge or furnace for hardening and tempering, tempering baths, repair tools, grinders, goggles and adequate lighting. Repairs should be done by thoroughly trained men.

An adequate supply of repair parts should be kept on hand.

Non-Sparking Tools

Where hand tools may strike a spark and ignite flammable dust, gas or vapor, non-ferrous tools are widely used. These tools are made of such metals as aluminum, bronze, brass and beryllium-copper.

Tools made of these alloys include hammers, chisels, punches, prybars, screw drivers, scrapers, spatulas, picks and shovels. Special tools of any type can be made to order.

Substances easily ignited include gunpowder, lint, TNT, carbon disulfide and ethyl ether.

Being softer than steel, non-ferrous tools are less likely to break off fragments from the metal being worked on by the tool.

With continued use, these tools may become impregnated with particles of foreign substances which may cause sparks if not removed.

Non-ferrous alloys are more expensive than steel and these special tools are used only where there is an explosion hazard.

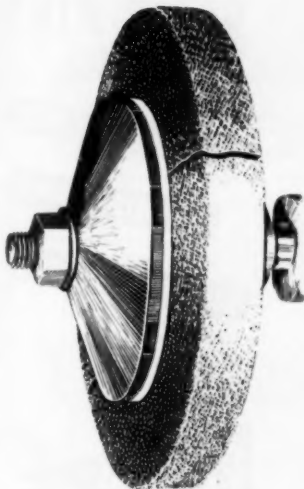
Portable Electric Tools

General classifications of hand-operated power-driven tools are:

THE STORY of the BROKEN GRINDING WHEEL!

A whirling grinding wheel can tell its own story of havoc when it breaks. . . . But in this case *Perks Safety Washers* do the telling!

A test conducted by the *StaSafe* laboratories used the NEW reinforced plastic backed *Perks Safety Washers* and an 8" grinding wheel cracked in two places. At 5000 RPM—an outer surface speed of 12,500 feet per minute—the new *Perks Safety Washers* held the wheel intact!



Standard Safety does not recommend to you the use of broken grinding wheels — even with *Perks* . . . but Standard Safety does recommend *Perks Safety Washers* as a precaution against possible tragedy in your company.

Perks Safety Washers are easily installed on any size grinding wheels. Keep your equipment and personnel safe-guarded. Write now for Bulletin No. 541 containing complete information about *Perks Safety Washers*!

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Complying with all Safety Codes
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POWER PRESSES — WOOD WORKING MACHINES
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ELASTICONE® GUIDE PIN COVERS

JUST SNAP INTO PLACE

NO TOOLS REQUIRED

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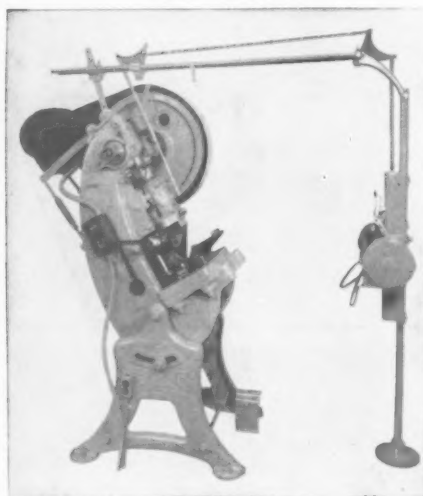
Elasticones are manufactured in stock sizes. Specify O.D. of bushing and full open height of set when ordering.

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Protects Pins and Bushings from nicks, scratches... prevents injuries to Die Setters & Operators. Write for full information.



The SENTINAL has many favorable features.
The hand can NOT remain in the danger zone. Quickly adjusted at elbow.

Every detail of construction of THE SENTINAL guard is designed and tested to comply with the CODE of the AMERICAN STANDARDS ASSOCIATION.

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No obstructions
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1. Abrasive tools, such as disk and portable belt sanders, polishers, and bench and flexible shaft grinders.
2. Drills.
3. Saws and other cut-off tools, routers, etc.
4. Assembly tools, such as screw drivers, nut runners and tappers.
5. Hammers.
6. Sheet metal shears.
7. Fans.

Portable electric tools are generally designated as:

Light duty, for intermittent use on light work.

Special duty or standard duty, for slightly heavy work or fairly continuous operation.

Heavy duty, for continuous operation and production service or for heavy work.

Safety switches, which operate the motor only while the switch is held in the closed position by the operator, should be used.

Three possible methods of preventing electric shock to the operator are: (1) Prevent electric contact with the shell; (2) Use non-conductive material for the shell and all parts which the operator may handle; (3) Ground the shell by means of a third wire or central grounding.

Grounding is generally considered the most practical method of safeguarding the operator against shock.

Guarding the Machine

—From page 165

Automatic feed should be supplemented by a substantial enclosure which isolates the point of operation. This provides much safer operation, especially on slow-moving presses.

Machine parts are sometimes adjusted to minimize the hazard of operation, as in limiting the stroke on a press so that the fingers cannot enter between the dies.

Die design. On punch and forming presses it is frequently necessary to install guards of a different type for each set of dies used. For this reason, enclosure guards should always be considered integral parts of the dies.

Hood enclosure and cover guards are used on woodworking machines and many other types of equipment. Frequently, such guards are automatic in action. Others are of rigid construction.

Nip hazards, such as rubber mills, calender rolls, dough breaks, and others, can be protected by sensitively adjusted controls that operate dynamic brakes when contacted by any part of the operator's body. These guards stop the machine in the shortest possible time.

"NO OPEN HANDLING
OF INFLAMMABLE LIQUIDS"
WITH

Insto-gas

**TORCHES
and FURNACES**

THEY'RE
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**NOW IS
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to check the portable heating equipment in your plant. If your torches and furnaces are not listed by Underwriters, be sure to get Insto-Gas immediately. Insto-Gas is non-explosive from concussion, chemically staple and non-toxic. Insto-Gas cylinders are I.C.C. approved, they have diaphragm type valves, positive closing spring relief valves and are equipped with excess flow safety checks. For over 17 years these safety features have made Insto-Gas first choice in all kinds of plants.

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Insto-Gas instant lighting torches and melting furnaces provide safe portable heat for all kinds of maintenance and repair work such as removing bearing metal, pre-heating, annealing, melting babbitt, thawing frozen pipes, relining vats and tanks, melting metal, paraffin, asphalt or tar, soldering copper pipe fittings and all electrical and plumbing work.

Insto-Gas is listed by both Underwriters' and Factory Mutuals' Laboratories.

Write today for literature and name of nearest distributor.

Insto-Gas Corporation • Detroit 7, Mich.

Two-hand controls are frequently installed on power presses, bakery machinery, guillotine paper cutters, and other types of equipment where barrier guards are not practicable.

Interlocking devices are used on centrifugal extractors, dough mixers, some types of pressure vessels, tumblers and other machines that require covers or barricades in place before the starting control can be operated.

Supervision. Operators occasionally make safety devices ineffective in an attempt to speed up output or make operation easier. This is especially frequent with two-hand controls. Operators should be warned of the hazards involved and instructed in the use of safety devices.

Frequently checks should be made to see that instructions are observed and that safety devices are functioning.

Photoelectric guards. The photoelectric relay consists of a beam of light. When this is broken by the press operator's hands the start or completion of the ram stroke is prevented. The photoelectric relay responds instantaneously, is completely automatic, takes up little space, is easily installed and economical to maintain. Against these advantages are comparatively high installation cost and limited uses.

On presses with friction clutches, the ram travel will stop immediately when the light beam is broken. This method is not effective on presses with positive clutches because the ram will continue its stroke until the end of its cycle. The guard should be operated from a closed electric circuit so that current interruption will automatically prevent the press from tripping.

Power Transmission

Power transmission apparatus includes shafting, belting, pulleys, gears, starting and stopping devices, and other moving parts of equipment used in the mechanical transmission of power. Also included are prime movers, intermediate equipment, and other machines.

Power transmission parts, particularly in modern installations, contribute a relatively small proportion of the total number of injuries. Nevertheless they can cause permanently disabling injuries and should not be neglected.

Individual motor drives and modern designs with moving parts enclosed have eliminated much guarding on the job. However, some guards must still be added when machines are installed.

Materials for Guards

Sheet metal, perforated metal, expanded metal, heavy wire mesh or bar stock may be used for most types of guards.

Transparent plastic is used where inspection of moving parts is neces-



Protect Operators • Increase Production

Wiesman cam-action press guards enable operators to work at top speed without fear of accident. Guarding is effective and completely automatic . . . does not hamper operator's vision or movement. For all sizes and styles of presses. Used by hundreds of firms. Inexpensive . . . easy to install.

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PROTECT OPERATOR AND GUIDE PINS

Effectively guard against injury to operator, die and press on operations where bushings leave the guide pins. Protect pins and bushings from chips and dirt when entire pin and bushing are covered. Inexpensive, easy to attach.

Felt Oiler Ring in top units provides POSITIVE lubrication.



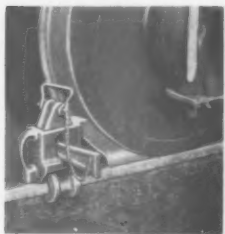
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EMPLOYEES ARE **SAFE**
BECAUSE IT WILL NOT SLIP
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The M & M Rail Clamp is a compact, complete unit, that holds heaviest cars in immovable position. Saves time in moving up . . . No blocks, ties or shims are necessary. It is strongly constructed to give you years of good service under tough conditions. Body is electric furnace steel casting; lugs and wedges are highest grade drop forgings; wedge is attached to clamp with strong steel chain so it won't be lost or misplaced.

The M & M Rail Clamp is made in two sizes to fit any rail worn or new
—Model A-40 to 100 lb. rail; Model F-110 to 175 lb. rail.

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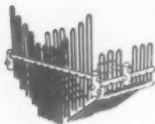
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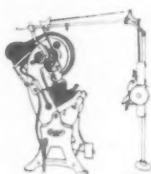
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Type FS, pivot slot action
for punch presses.

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Head Safety Wristlets for
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fastening type.



ELEVEN different types of punch press guards—also special transmission units, electronic attachments for pullback guards, safety wristlets, cords and other safety appliances.

Write for Bulletin.

As Appearing in the Chicago Red Book (Page 1598)

As Appearing in Thomas' Register (Page 15581)

ALL AMERICAN SAFETY EQUIPMENT COMPANY

11 South La Salle St., Chicago 3, Illinois — RA ndolph 6-8481

SAFETY ENGINEERS • DESIGNERS • MANUFACTURERS • DISTRIBUTORS

sary and the strength of metal is not needed.

Shatter-proof glass is used in similar situations, particularly where illumination of guarded parts is essential and the flexibility of plastic is not required.

Where flying particles may mar safety glass or plastic, the surface may be protected by replaceable glass covers.

Wooden guards are relatively low in strength but are sometimes used where splashes and fumes from corrosive substances would attack iron or steel.

Where resistance to rust is essential, or there is possibility of damage to the machinery from iron or steel, guards of aluminum or other soft metals may be used.

Electric Equipment

—From page 166

Plug fuses are used on circuits which do not exceed 30 amperes at not more than 150 volts to ground. The type which cannot be bridged inside the holder is recommended.

Cartridge fuses have fusible metal strips enclosed in fiber tubes. Those which indicate when the fuse is blown and the refillable types in which fusible elements may be replaced are available.

Where practicable, fuses should be protected by a switch which will make the fuses dead when opened. Insulated fuse pullers should be kept on hand for pulling and replacing fuses.

Circuit-breakers are used in high voltages or large current capacity circuits, and are becoming more common in many kinds of circuits. They may be instantaneous in operation, equipped with timing devices, manually or power operated.

Switches

Available switches include snap switches, knife switches, enclosed externally operable air-break switches, and oil switches. Those designed for controlling individual motors and machine tools and for lighting and power circuits are of the enclosed type.

Open-knife switches are undesirable because of exposure of live parts and because of the arc formed when the switch is open. It is advisable, therefore, to enclose knife switches in grounded metal cabinets having a control lever extending through a slot in the cover.

Oil switches have contacts which operate while submerged in oil. They are especially desirable in circuits of 750 volts or more and may be used also in lower voltage circuits.

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SECTION 7

Plant Protection

Defense Against Fire

FIRE SAFETY involves:

1. Fire prevention engineering
2. Early detection and extinguishment
3. Limiting damage due to fire and fire extinguishment
4. Protection of personnel from fire and resulting panic.

Helpful sources of information are: fire insurance carriers, local insurance inspection bureaus, municipal fire departments, National Fire Protection Association, National Board of Fire Underwriters, Underwriters' Laboratories, Associated Factory Mutual Laboratories.

Causes. The majority of fires in industrial property can be traced to four general causes:

1. Open flames and high temperatures—stoves, furnaces, ovens, lamps, welding and cutting, dryers, heated pipes and surfaces, matches and smoking.
2. Friction—hot bearings, belts, cutting, grinding, drilling.
3. Electricity—defective wiring, static electricity, arcs, sparks, heat resistances.
4. Chemical reactions—spontaneous ignition, use of reagents, acids, oxidizing agents.

Incendiary fires. These may be the acts of enemy agents, individuals with grievances, and trespassers who try to cover up theft or are merely careless with fire. The situation may call for a general tightening up of plant protection measures, careful identification of employees and, in some cases, establishment of restricted areas.

Regional offices of the Federal Bureau of Investigation are ready to work with industry in the prevention of subversive activities.

Planning Protection

The first step is a survey of the plant—its layout, manufacturing processes, materials handled, storage methods, and fire protection facilities.

With this information, plans can be made for improving structure and layout, installing additional or different equipment where necessary, and training employees in methods of prevention and extinguishment.

The municipal fire department should have a prominent place in all plans. Its members should be familiar with the plant and its problems. They can also give helpful suggestions on training and equipping plant fire brigades.

The plant should not depend on the city fire department alone. Even under the best conditions, it takes time for outside apparatus to reach the fire, and in times of emergency the department may be busy elsewhere.

In many plants, fire protection is one of the responsibilities of the safety department. Even in larger plants where there is a division of duties, the safety department has an important part in any program involving protection of life and property.

Plant organization for fire-fighting may range from a few trained em-

ployees with hand extinguishers to a full-time company fire department rivaling those of some cities.

Fire squads. The first step for any plant is to organize fire squads. A squad may consist of five or six men in each department. They should act as inspectors, reporting and correcting conditions which might cause fires. They should be taught the use of extinguishers, by actual demonstration of equipment on small fires, where practicable.

Men so trained will keep their heads in an emergency. They put out many fires before they do any serious damage, and also help to prevent panic.

Fire brigades. For the larger plant, hydrants and hose systems are important items of protection and they need trained men to use them. Members of department squads can be members of the plant fire brigade.

These men should be familiar with all details of the plant, its protective system and water supplies. They should be drilled frequently in handling hose streams, which is no job for an amateur. Each man should have a definite task. Some should be assigned to protecting goods and machines from water damage.

Private fire departments. Some plants whose buildings and grounds cover a large area have full-time fire departments with motorized equipment. The department supervises the whole plant protection program and is trained in specialized techniques of fire fighting.

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Instructing the plant fire department in use of equipment. (Pure Oil Co.)

First-Aid Extinguishers

PORTABLE extinguishers can be brought into action in the vital minutes before the company or city fire brigades can reach the blaze. Their prompt use by employees has prevented a vast amount of damage by fire and water.

Effectiveness of extinguishers depends on:

1. The right type for the risk. The wrong type may actually spread a fire, or create other hazards.
2. Correct location. If the employee must go too far to reach one, or if access is blocked, valuable minutes may be lost.
3. Regular inspection and maintenance. Apparatus is subject to deterioration and misuse.
4. Training of employees. The best extinguisher is useless in the hands of a person untrained in emergency procedure.

Types and Uses

Common types of extinguishers are:

1. Soda-acid
2. Vaporizing liquid
3. Carbon dioxide
4. Foam
5. Dry chemical
6. Gas cartridge
7. Hand pump

Some extinguishers are valuable in both hand and wheel types. The wheel type is highly mobile and the extra extinguishing capacity is often needed.

For Class A Fires Only:



The soda acid extinguisher is filled with a solution of bicarbonate of soda. A bottle in the top contains sulphuric acid. When the extinguisher is turned upside down, the chemicals mix, forming a gas which propels a stream of water.

Most extinguishers of this type have a capacity of 2½ gallons. They provide a stream of 30 to 40 feet lasting about one minute.

Types of Fires

Fires have been classified by underwriters and manufacturers in three main groups.

Class A. Fires in ordinary combustible materials, such as wood, paper, textiles, and rubbish. They require quenching or cooling effects of water or solutions containing large proportions of water.

Class B. Fires in flammable liquids, such as gasoline, solvents, oil, grease, paint, varnish and lacquers, where blanketing or smothering effect is essential.

Class C. Fires in electric equipment, such as motors, generators, and switch panels. These require a non-conductive, extinguishing agent.

Fires in motor vehicles, aircraft and motorboats have the same problems of extinguishment as Class B but equipment must be portable. Extinguishing agents must be nonfreezing.

The gas cartridge extinguisher looks much like the soda-acid. It also operates the same way except that after it is inverted it must be bumped on the floor. This drives a pin into the cartridge, releasing the compressed gas which forces water through the hose. The extinguisher may contain either plain water or water with an anti-freeze chemical added.



The pump tank is made in 2½ and 5 gallon sizes. Plain water or a non-freezing solution can be used. Hard pumping will force a stream 30 to 40 feet. It is difficult to use while being carried. Somebody else can refill it while it is in use.

For Class A and Class B Fires:

These extinguishers are suitable for use on Class A fires in ordinary combustibles and Class B fires in flammable liquids. They should not be used for fires in electrical equipment.

The foam extinguisher is shaped like the soda-acid and is operated the same way. In the outer part of the extinguisher is a solution of water, bicarbonate of soda and a foam making ingredient. The inner chamber contains water and aluminum sulphate.



FIRE EXTINGUISHMENT

Keep extinguishers in the clear. Do not tamper with them. Know where they are and how to use them.



In case of fire:

1. Turn in an alarm at once.
2. Use the right type of extinguisher.
3. Use equipment correctly. Do not delay.
4. Make certain the fire is out.
5. Be sure the equipment is made ready for re-use.



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When the extinguisher is turned upside down the chemicals mix and force out a stream that looks like foam. The extinguisher contains 2½ gallons of liquid and generates eight times that amount of foam.

Foam extinguishers also come in 10-, 20- and 30-gallon wheeled units.

The loaded-stream extinguisher looks and operates like the gas cartridge type. Instead of water it contains a special solution of an alkali-metal salt.

Extinguishers which may be used on Class B and C fires:

These are the only extinguishers which may be used safely on Class C fires (electrical equipment) as well as flammable liquid, or Class B, fires. They do not contain water.



The vaporizing liquid extinguisher, one-quart size, is one of the most familiar types. It contains carbon tetrachloride. It is operated by pumping the handle. In contact with heat the liquid turns into a heavy vapor which blankets and smothers fire.

In addition, vaporizing liquid works effectively on Class A fires. Range is about 20 feet and stream lasts 45 seconds.

Larger units of ½- to 3-gallon capacity are operated by stored gas or air pressure.

The carbon dioxide extinguisher discharges gas through a horn-like nozzle by operating a hand wheel, squeeze grip or trigger type mechanism. These extinguishers are available in a wide range of sizes, containing from 2 to 750 pounds of carbon dioxide. The larger units are mounted on wheels. The gas is non-corrosive and leaves no residue.

Successful operation requires a close approach to the fire.



The dry chemical extinguisher operates by squeezing a handle or turning a handwheel at the top, which punctures a cartridge of carbon dioxide in the neck of the extinguisher. This forces bicarbonate of soda out through the hose. The powder is treated to prevent caking.

The 15-, 20-, 25- and 30-pound sizes have a range of 10 to 12 feet. The 140- and 300-pound extinguishers can discharge a stream 35 to 45 feet or a fan shaped stream of shorter range.

—To page 187

Automatic Protection

DEVICES which automatically detect fire, sound alarms and put out fires stand guard over life and property 24 hours a day. This protection is most needed when the plant is shut down at night or on week ends and holidays but it is valuable in supplementing human watchfulness when men are at work.

Automatic plant guards are of two types:

1. Fire detection and alarm systems.
2. Sprinkler and chemical extinguishing systems.

Signal Systems

Signal systems of various types detect fires and give alarms, and supervise sprinkler systems, water supplies, and watchmen's service.

Signal systems are operated on three main plans:

1. **Central station system.** Signals are transmitted to an independent central station where they are recorded and proper action for the emergency taken. The central station may serve several companies.
2. **Proprietary system.** Similar to a central station but controlled and operated by the owner of the protected property.
3. **Local system.** Owned and operated by the protected company but does not have an operator constantly on duty at a central station.

Detectors and Alarms

Fire detection and alarm devices operate on the mechanical, pneumatic-electric, straight electric, and electronic principles. Some of the newer types are based on some form of electronics in conjunction with thermostats. These are more sensitive than the earlier types.

Electronic devices have been installed on ships where air samples from the cargo holds are drawn through a cabinet past an electric eye or gas analyzer which detects smoke instantly and sounds an alarm. Detectors similar to the marine type can be used in many industrial locations.

Where fires may start slowly and smolder for some time, photoelectric equipment often detects smoke before heat-actuated devices are affected.

Watchmen's supervisory systems transmit and record signals made at watchmen's key stations. This system is frequently combined with fire alarm systems. A plant guard's failure to check in at any station along his route is promptly recorded at the control desk or panel.

Such supervision has checked many incipient fires, prevented many robberies and brought aid to watchmen rendered helpless by accident or sud-

den illness. It has also prevented much water damage by sprinklers.

Automatic Sprinklers

Sprinklers go into action automatically soon after a fire breaks out, deluging the area below. They operate in heat and smoke and control fires that could not be reached by other means. Since their introduction in 1875 they have played an important part in reducing industrial fire losses.

Over a period of years, insurance records show that more than 95 per cent of fires in sprinklered buildings were extinguished or held in check by sprinklers.

In the few cases where sprinklers have failed to function when needed, the fault has rarely been due to the sprinkler mechanism. Deficient water supply, freezing, defective dry pipe valves, foreign material in the system, corrosion, obstruction of sprinkler heads by stock piles, or paint on the sprinkler heads are among the causes.

The sprinkler head contains a fusible plug which melts and releases the water when a predetermined temperature is reached. Valves control distribution of water to all parts of the system.

Various types of heads are available for use under a wide range of temperature conditions.

Wet-pipe systems are used where there is no danger of pipes freezing. Water is maintained under pressure right up to the sprinkler heads and operation is immediate.

Dry-pipe systems are used where there is danger of pipes freezing. Air under pressure instead of water, is maintained in the pipes. Opening of a sprinkler head releases the air pressure, resulting in the operation of a valve admitting water to the system. There is a slight delay between the opening of the sprinkler head and the discharge of water.

After a fire, sprinkler heads should be replaced promptly.



The watchman's effectiveness in protecting the plant is increased by automatic detection and signal equipment. (ADT)

WATCHMEN

Keep flashlight or lantern in good condition.

Use stairs, ladders and elevators carefully.

Know how to reach hospital, doctor, fire and police in a hurry.

Be able to give yourself first aid.

Avoid tripping hazards, holes and nails in floors.



Watch the plant for:

1. Bad housekeeping, particularly oily rags and flammable stuff.
2. Materials piled near sprinkler heads and fire equipment. Fire doors blocked or left open.
3. Signs of smoking in dangerous places.
4. Leaks of flammable liquids or gases.
5. Open flames, gas or electric heaters operating improperly or out of order.
6. Fire fighting equipment out of place or out of order.



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Sprinkler supervision. Sprinkler systems include devices to give automatic alarms when the sprinklers operate. These devices detect:

1. Open or closed position of control valves.
2. Flow of water in sprinkler systems, indicating fire or leakage.
3. Water levels and temperatures in gravity and pressure tanks.
4. Air pressure in dry-pipe systems and pressure tanks.
5. Fire pump steam pressure.
6. Voltage of supply for electric fire pumps.

Special Systems

For special risks, automatic systems employing carbon dioxide, foam or water spray nozzles may be installed.

Carbon dioxide is particularly desirable where the system operates in an enclosed space and the value of the contents is high and subject to water damage. Carbon dioxide is discharged manually or by means of heat-actuated devices.

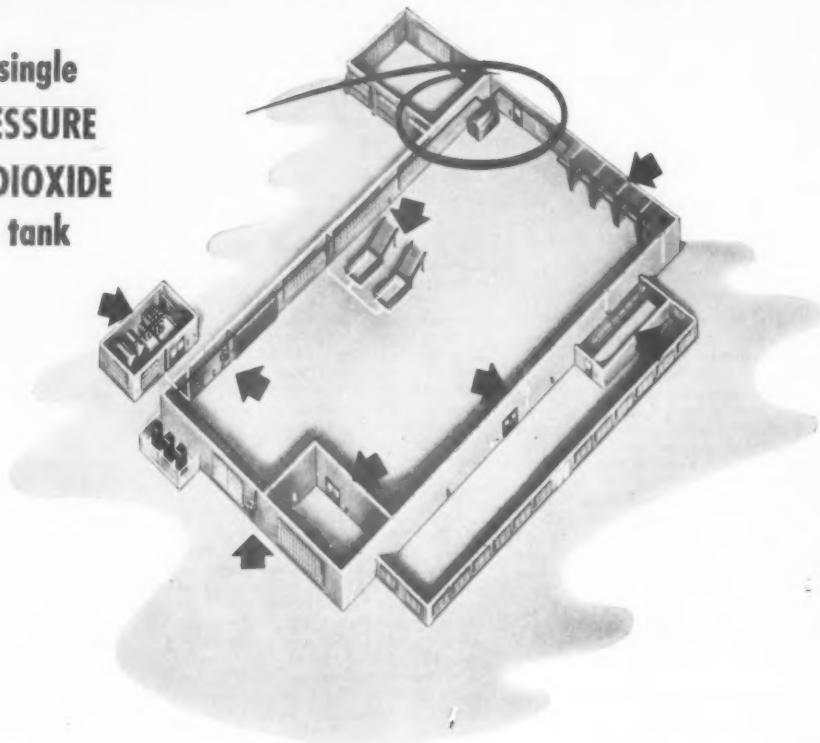
Devices are also provided for closing shutters, doors, windows and dampers and stopping blowers to confine the extinguishing gas. These systems are suitable for spaces containing electric equipment or flammable liquids.

Foam installations are suitable for tanks and operations involving flammable liquids but not for electric fire hazards. They are usually arranged to operate automatically with provision for manual operation.

Water spray systems are used to protect oil-filled electric equipment, such as transformers, oil switches and oil piping and open tanks of flammable liquids. To be effective, water spray systems require expert installation.

Plant-Wide Fire Protection

from a single
**LOW PRESSURE
CARBON DIOXIDE**
storage tank



Now, your larger size fire hazards can be protected more efficiently at less cost, thanks to C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems. Simple piping, running from one centrally located storage tank, instantly transports clean, non-damaging, non-conducting carbon dioxide anywhere in the plant area . . . to flammable liquids, electrical equipment, storage spaces, manufacturing processes and record vaults. Fire at any protected location is extinguished in seconds with an absolute minimum of expense and interruption.

Flexibility is the keynote of these new type C-O-TWO Fire Extinguishing Systems . . . the low pressure carbon dioxide storage tanks range in capacities from one to fifty tons . . . discharge facilities can either be manual mechanical, manual electric, automatic mechanical, automatic electric or a combination of these . . . especially installed to fit your particular needs. Future plant expansion is easily and

economically provided for by initially installing an oversized low pressure carbon dioxide storage tank and adding the supplementary discharge facilities at a later date.

C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems are built with the same superior design and high quality workmanship that have characterized C-O-TWO High Pressure Carbon Dioxide Type Fire Extinguishing Systems for many years. Whether it's fire detecting or fire extinguishing . . . portables or built-in systems . . . C-O-TWO means experienced engineering that assures you of the best type equipment for the particular fire hazard concerned.

So, with current expensive delayed replacements, why not let an expert C-O-TWO Fire Protection Engineer help you now in planning fully approved fire protection facilities for your various properties. Complete free information and descriptive literature are yours for the asking. Get the facts!



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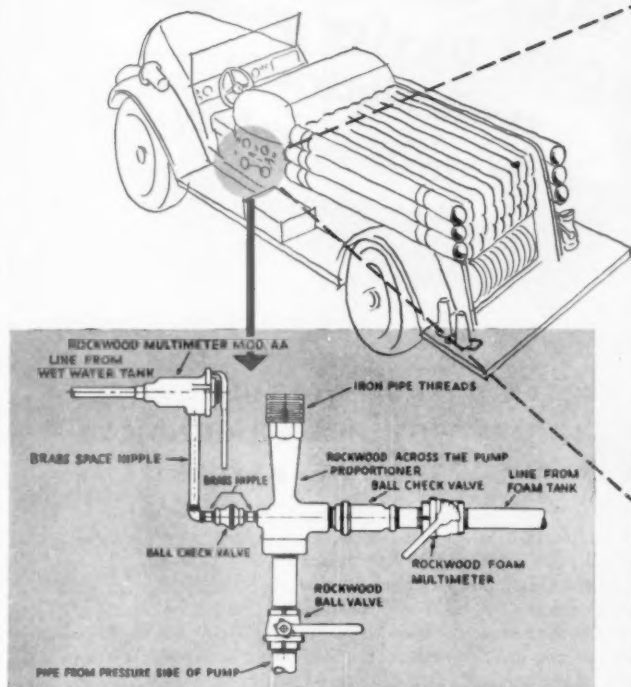
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Squeeze-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers • Built-In Smoke and Heat Fire Detecting Systems
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Flaming Liquids Stop Short! Water Goes Farther!

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ACCURATE MIXING ASSURED. Automatically feeding FOAM or WET Liquids into hose lines, Rockwood's Model Dual "B" Around-the-Pump Proportioner is designed for use where pressure is maintained by a pump from either draft supply or booster tank. Multimeter settings admit proper amounts of wetting agent for varying nozzle discharges and solution strengths.

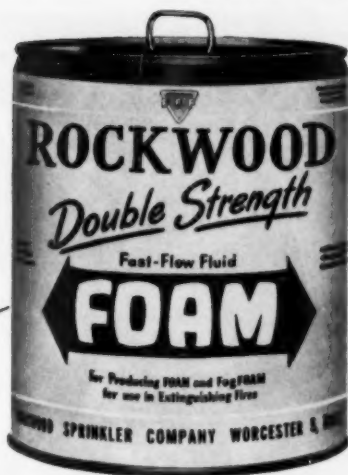
A proportioning system to meet YOUR needs.

Different types of fires call for different proportioning systems for large-volume FOAM or WET discharge. Rockwood specializes in custom-engineered proportioning systems to meet particular needs, for all mobile equipment. Write for details.

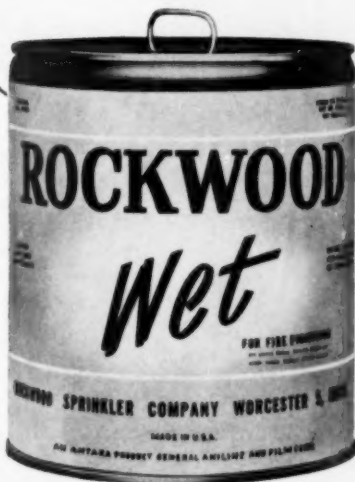
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72 Harlow Street, Worcester 5, Mass.
PORTABLE FIRE PROTECTION DIVISION



TO PUT OUT FIRES IN FLAMMABLE LIQUIDS FASTER AND AT LOWER COST, use Rockwood's new Double Strength FOAM Liquid. Three parts of FOAM Liquid mixed with 97 parts of water form an excellent foam blanket that will quickly re-seal if broken. This foam blanket has proved its ability to extinguish large spill fires in gasoline with maximum speed and safety to firemen. Double Strength FOAM Liquid is more fluid, faster spreading and flows freely at sub-zero temperatures (-15°F.). Rockwood Regular FOAM Liquid is also available for use with Rockwood devices.



TO MAKE A LITTLE WATER GO A LONG WAY, use Rockwood WET, a wetting agent prepared especially for fire fighting. WET speeds the spread and penetration of water into deep seated fires in such ordinary combustibles as wood, paper, cloth, etc. Thoroughly tested in action, a mixture of 1 part WET to 99 parts of water will help reduce the time, manpower and quantity of water needed to put out the stubbornest fires. WET retains its remarkable penetrating quality even at fire temperatures.

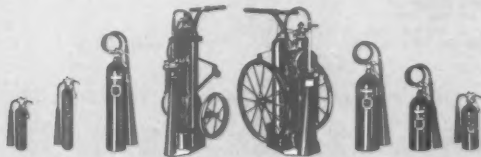
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★ **ALFCO ANTI-STATIK**
HORN Device grounds
static electricity,
insures safety.

**ALL ALFCO CARBON DIOXIDE FIRE EX-
TINGUISHERS WITH HOSE CONNECTIONS
HAVE ALFCO ANTI-STATIK HORNS**

All commercial Alfco Carbon Dioxide Extinguishers having hose connections are equipped with an exclusive Alfco Anti-Statik Discharge Horn which grounds static electricity, eliminating the possibility of shock to the operator from a static charge generated by rapid release of gas. Smaller size units with shorter swivel type horns do not require this feature. There is a capacity size model to meet your requirements from 20 lbs. down to 2½ lbs. Wheeled Engines also available in 50, 75, and 100 lb. sizes.

Sectional view of Alfco
Anti-Statik Horn



* On All ALFCO Carbon Dioxide Hand Portable
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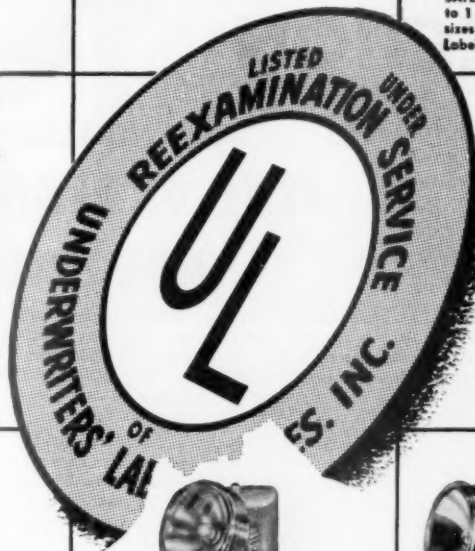
SAFETY FILLING CANS. Flexible metal pouring hose. 3 or 5 gallons.



SAFETY CANS. Seven sizes. One pint to 1 gallon with trigger handle, larger sizes with swing handle (shown). Labeled by Underwriters'.



Model 1610 EXTINGUISHER
Entirely new development in carbon tetrachloride extinguishers. Labeled by Underwriters'. Air pressure operated. Easily refilled.



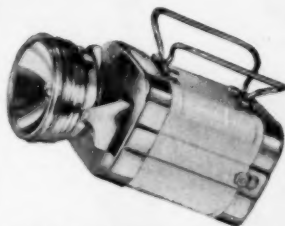
OILY WASTE CANS
Heavy gauge galvanized for safe handling of waste, rags and other flammable materials. Underwriters' labeled. Sizes, 6 to 25 gal.



NO. 1904-S HEADLIGHT. Adjustable elastic headband. Case easily slipped in pocket holds 4 standard flashlight cells.



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NO. 2146-S FLASHING. Up to 67 hours continuous flashing service. Red Fresnel glass globe. For 6-volt battery.

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ANSUL FIRE EXTINGUISHING EQUIPMENT

DRY CHEMICAL



MODEL 4



MODEL 4-B



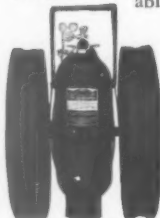
MODEL 20-B



MODEL 20-B



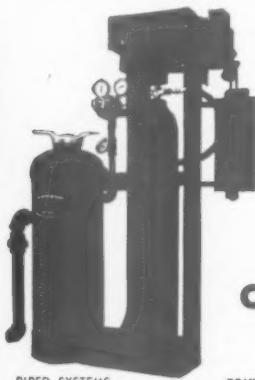
MODEL 150-A



MODEL 350-A



MODEL J1-340



PIPED SYSTEMS

You, who have seen or used an Ansul Dry Chemical Extinguisher at a fire demonstration or on an actual fire, quickly recognized its superior fire-fighting capabilities. Further investigation proves that Ansul "Water-tight Construction" provides greater dependability under severe exposure conditions.

Fire Chiefs, insurance inspectors, safety engineers, etc. recognize Ansul as the leader in the dry chemical fire extinguisher field. Ansul Fire Extinguishing Equipment and "PLUS-FIFTY" Dry Chemical have set unparalleled standards of quality for the fire extinguisher industry.

You get complete dry chemical fire protection only from Ansul. There is an Ansul Dry Chemical Fire Extinguisher of the proper size for almost every flammable liquid, gas and electrical fire hazard.

Safeguard your plant and irreplaceable equipment with the *BEST* fire extinguishing equipment available. Protect them with ANSUL EXTINGUISHERS.

ANSUL EXCLUSIVE FEATURES

- Patented Nozzle assures most effective stream pattern . . . Best results by inexperienced operators.
- Special packings in Nozzle and other parts exclude water.
- Corrosion resistant construction throughout.
- Easy on-the-spot Recharging (No tools needed).
- Quick, positive puncture operation.
- Special guard protects cartridge . . . rugged construction throughout.
- Ansul "PLUS-FIFTY"® Dry Chemical used exclusively.
- Field tested by thousands of satisfied customers.
- Ansul LT Models are the only dry chemical extinguishers listed by U.L. for operation at -65° F.

Send for File No. 716. You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.



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MANUFACTURERS OF INDUSTRIAL CHEMICALS • REFRIGERANTS AND REFRIGERATION PRODUCTS • DRY CHEMICAL FIRE EXTINGUISHERS

Extinguishers

—From page 180

Approval. Approved extinguishers carry the label of Underwriters' Laboratories and/or Factory Mutual Laboratories. Such extinguishers bear an instruction plate giving directions for inspecting and recharging, also the type of fire (Class A, B or C) for which the equipment is recommended, and its unit rating.

Only approved extinguishers should be purchased. One essential is adequate capacity. A vaporizing liquid extinguisher must contain not less than one quart of the extinguishing agent to meet recognized standards.

Placement. An extinguisher may be useless if an employee must spend valuable minutes looking for it, or if it is blocked by piles of materials. Here are six recommended rules:

1. Locate extinguishers close to likely fire hazards but not so close that they will be in the fire zone should fire occur.

2. Place extinguishers so access to them will not be blocked by fire.

3. Install enough extinguishers to deal with any blaze which may be expected, the rapidity with which it might spread, intensity of heat, etc.

4. Mark locations conspicuously.

5. Identify each unit for the type of fire it is designed to combat.

6. Protect extinguishers from traffic.

Recharging. Commercial carbon tetrachloride should not be used for vaporizing liquid extinguishers. It may cause deterioration of the shell and interior mechanism. Vaporizing liquid furnished by manufacturers is treated to remove impurities and to depress the freezing point.

Before recharging soda acid and foam extinguishers, the shells and all parts should be thoroughly rinsed with warm water.

Protection from Freezing. Carbon dioxide, vaporizing liquid and dry chemical extinguishers will not freeze.

Soda-acid and foam extinguishers should be installed in heated cabinets.

Gas cartridge extinguishers, pump tanks and fire pails use calcium chloride solutions.

Marking locations. Contrasting backgrounds make extinguishers conspicuous in the excitement of a fire. Methods include:

Painting a large red or white background on the wall.

A large red spot on the floor under the extinguisher.

Vertical red bands with yellow borders down a wall or column where equipment is placed.

Lights of distinctive color which do not conflict with exit lamps.

Many Costly Fires Like This Are PREVENTED by "AKBAR" —

The Famous KINNEAR Rolling Fire Door



40% of the biggest fires in a single year showed lack of fire-door protection as contributing to the heavy losses.*

You get positive, automatic, dependable fire protection at doorways and windows with Akbar Fire Doors. They're pushed downward by a strong spring . . . controlled in downward speed . . . and operable after closure, for emergency use.

These efficient doors remain coiled out of the way overhead when not in use, but lower into place automatically, with speed, efficiency and safety when fire threatens. They combat fire loss by cutting off drafts, blocking flames, and

confining fire to small areas. Approved and labeled by Underwriters' Laboratories, they have saved as much as 33% of their cost annually, in reduced insurance rates. Built to fit windows, doorways or other openings of any size.

"Akbar" Doors can also be equipped for daily service use, with or without motor operation. But the regular (non-labeled) Kinnear Rolling Doors are preferred for service use where extra fire protection is not needed.

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KINNEAR
ROLLING DOORS

*(As reported in the Jan. 1947 Quarterly of the National Fire Protection Association.)

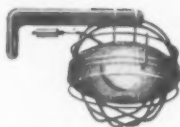
Which do YOU need to protect YOUR business from FIRE?



Kidde Multi-Jet Nozzle. The "business end" of a Kidde CO₂ fire extinguishing system. It blankets flame with fire-smothering carbon dioxide.



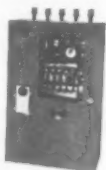
Kidde Dry Chemical Wheeled Extinguisher. A "one man fire engine" to control large fires in flammable liquids, live electrical equipment.



Kidde "Heat Detector". 24 hours a day this sensitive detector stands guard ready to set off a Kidde CO₂ system automatically if fire should strike.



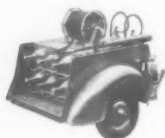
Kidde Carbon Dioxide Portable. Fast-acting...easy to use. A pull of the trigger releases a rolling fog of CO₂ gas that smothers flame instantly.



Kidde Smoke Detector. A new development in industrial fire fighting. Detects hidden smoldering fire, tells in which room or vault it is located.



Kidde CO₂ Hose Reel Equipment. Combines the convenience of a portable fire extinguisher with the great fire-killing power of a built-in system.



Kidde Trailer. An economical, fast-acting unit for thorough-going fire protection in smaller plants and airports and auxiliary protection in larger ones.



Kidde Chemical Extinguishers. Foam, Soda-acid or water portable extinguishers in stainless steel. Two-and-a-half gallon capacity. Easy to use, reliable, economical.



Kidde Vaporizing Liquid Extinguisher. Approved for fires in flammable liquids and electrical equipment. Discharges carbon tetrachloride.

For many years Walter Kidde & Company, Inc. has specialized in fire extinguishing equipment. It ranges from 2½ pound portables to huge built-in systems. Need advice on protection for your plant? Call or write Kidde.

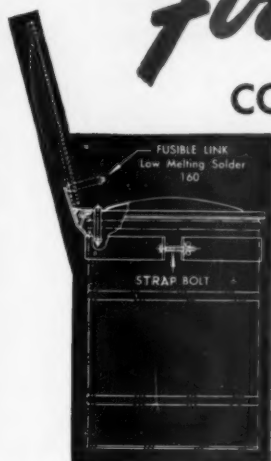
Kidde

Walter Kidde & Company, Inc., 345 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

CONVERT USED DRUMS INTO

Fireproof CONTAINERS



SPECIFICATIONS

The Protectoseal Self-Closing Drum Cover is constructed of heavy gauge steel, and is available in two sizes:

Cat. No. 4830 for 30 gal. drum
Cat. No. 4955 for 55 gal. drum

A fusible link closing device is set inside the cover near the hinge. At 160° F. the solder melts, releasing the plunger spring which closes the lid instantly. Should the fusible link be destroyed by fire, Protectoseal Special Solder replacements are easily screwed in position to reset plunger.

WITH ONE SPIN OF A WING NUT,

any inexperienced employee can convert a used steel drum into a valuable piece of fire-prevention equipment. No special tools are necessary. Fit the collar of the Protectoseal Self-Closing Drum Cover over the top of an empty 30 or 55 gallon drum and tighten the bolt. This simple operation makes a large capacity fire-safe waste container for combustible materials.



Protectoseal No. 003 Laboratory Bench Can

One-gallon oval shape can made to economize space on laboratory shelf. All the fire prevention features of a regular safety can including a double cylinder, perforated fire baffle. No channel around top of can to permit solvent or dust to collect. Smooth back surface for stenciling on names of solvents. Pistol grip—easy to grasp and pour out of can.



Protectoseal No. 750 Air-Matic Parts Washer

AIR POWERED (not air agitated) washing tank operates on any compressed air supply. In case of fire the 160° fusible link melts, drops lid and snuffs out fire. Parts to be cleaned move through the solvent instead of with it and thus minimizes turbulence and vapor losses. 6½ gallon capacity designed for use with mineral spirits.



Protectoseal Supply Can



Protectoseal Plunger Can



Protectoseal Oily Waste Can



Protectoseal Bench Can



Protectoseal Safety Can

FUSIBLE LINK CLOSURES COVER AUTOMATICALLY . . . SMOTHERS FIRE

If temperature within drum reaches 160°, the fusible link in the Protectoseal Drum Cover melts, releasing spring-loaded plunger. This action closes cover instantly snuffing out fire within drum or protecting contents of drum from outside sources of ignition.

Protectoseal Fire Extinguishers

Underwriters Laboratories Approved for Class A-1 fires. No. 280 2½-gallon and No. 281 5-gallon capacities. Constructed of heavy gauge lead coated steel with electrically seam-welded seams. Interior corrosion resistant-coated with two applications of asphalt base paint. Double action pump maintains steady pressure and stream of 30 feet minimum at normal pumping speeds.



Protectoseal No. 208 Tilt Can

Safe, anti-drip 5-gallon can pivots in a cradle and permits clear view of pouring, full control of flow rate and quick shut-off. Faucet and filler opening are self-closing by spring action and are equipped with double cylinder, perforated fire baffles to prevent ignition of contents.



FREE: Analyze hidden hazards on your property with "Self-Checking Chart" and booklet of FIRE Facts, or request an inspection by Protectoseal engineers. No obligation.

Since 1922 Pioneering Fire Prevention Devices for Industry

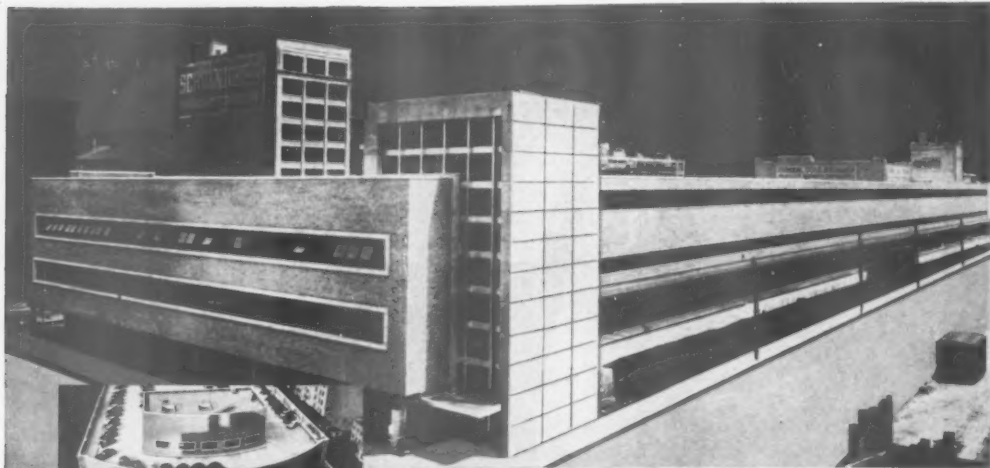


The PROTECTOSEAL COMPANY

1928 SOUTH WESTERN AVE.

CHICAGO 8, ILLINOIS

IN CANADA — SAFETY SUPPLY COMPANY — TORONTO



Pennsylvania-Duquesne Warehouse, Pittsburgh, Pa. Built by P.R.R. and operated by Pitt-Penn Terminal Co. . . the last word in streamlined efficiency and safety. Protected throughout by a Blaw-Knox Dry Pipe Sprinkler System supplying 5025 Underwriter-approved sprinkler heads.



Midtown Bus Terminal, New York City
9,763 Underwriter-approved sprinkler heads.



American Airlines, Chicago Airport . . .
Blaw-Knox fire protection throughout.



N. Y. Pier No. 42 . . . Norwegian-American Lines
protected with 6,726 approved sprinkler heads.



The utmost in protection for your property and goods in transit

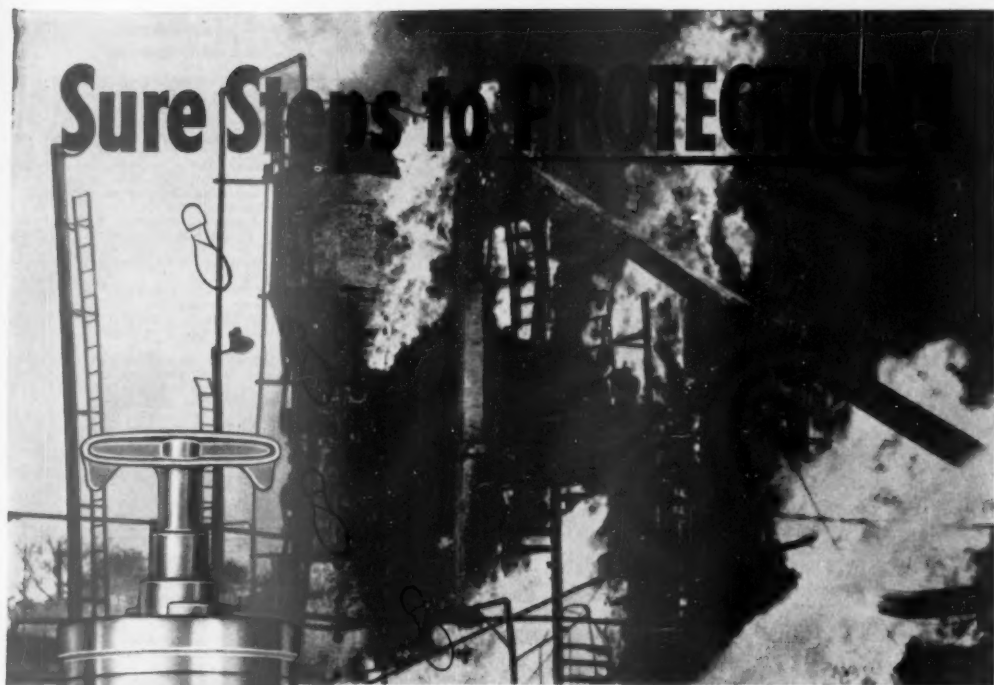
While they have no insurable interest in consigned merchandise, many transportation companies offer their shippers *an extra measure of service* by protecting both warehouses and contents with Blaw-Knox Automatic Sprinklers.

Insurance companies agree that there is no fire protection equal to an on-the-spot, fast-acting sprinkler system . . . one that's *engineered* for the hazards involved, and has proved its dependable efficiency in past emergencies. Glad to give you a preliminary survey and estimate cost without obligation.

BLAW-KNOX SPRINKLER DIVISION
OF BLAW-KNOX CONSTRUCTION COMPANY
829 Beaver Ave., N.S., Pittsburgh 33, Pa.

BLAW-KNOX **AUTOMATIC**
FIRE PROTECTION SYSTEMS

Sure Steps to PROTECTION



Escaping hexane vapors ignited by a welding torch caused this \$250,000 fire at the Continental Grain Co., Columbus, Ohio.



VAPORIZING LIQUID EXTINGUISHERS with. *dryex*

In emergencies like this, quick action with buffalo VL Extinguishers can save lives and property. Instant action against dangerous vapors, flammable liquids and electrical fires is easy with Buffalo VL Extinguishers. Built-in Dryex assures quick, trouble-free action. It absorbs all traces of internal corrosion-causing moisture. The double-acting, corrosion-proof Graphitar piston is not affected by temperature expansion or contraction. Only Buffalo offers you all these protection features. Plus an unconditional two year guarantee!

Buffalo manufactures a complete extinguisher line for positive protection from every fire hazard. Order Buffalo protection now! Consult your Classified Telephone Directory or write for your nearest Buffalo distributor.

UNDERWRITERS' LABORATORIES AND FACTORY MUTUAL APPROVED

BUFFALO FIRE APPLIANCE
CORPORATION
DAYTON 1, OHIO

NO INSTRUCTIONS NECESSARY WITH THIS EXTINGUISHER!

IT'S A RANDOLPH!

From bracket to blaze in split seconds!

No valves to turn, no nozzles to adjust; just point and press your thumb and Randolph's cloud of snowy CO₂ kills fire completely!

Non-damaging Randolph CO₂ evaporates without a trace, is non-toxic, won't conduct electricity, deteriorate or freeze. And *all* Randolph Models are Underwriters' Approved.

A complete line of extinguishers and automatic systems

Learn how Randolph gives your plant panic-proof, positive fire protection! Write Randolph Laboratories, Inc., 2 E. Kinzie St., Chicago 11, Illinois.



RANDOLPH SIMPLIFIED FIRE EQUIPMENT

REFERENCES Plant Protection

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Water Spray Systems for Fire Protection—Pamphlet 15.
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Industrial Fire Brigades Training Manual.
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"Better get new glasses, Jimson. You're reading that crack on the wall again."
(Courtesy Wheelock Instruments Company)

Which will happen to YOU?





A \$200,000 LOSS, as in this paint and varnish factory, can happen only where full fire protection is lacking. To more and more men responsible for protecting life and property, full fire protection means a carefully engineered alarm or release system incorporating Fenwal DETECT-A-FIRE® thermostats.



SPEEDY ACTION when fire starts helps keep losses low. Fenwal Rate-Compensated DETECT-A-FIRE thermostats activate alarm or release fire protection systems the instant the temperature of the surrounding air reaches the danger point. No hazardous delays! No troublesome false alarms! No other fire detection units are so positive.



YOU GET EXTRA VALUE, TOO, when your fire protection system includes Fenwal DETECT-A-FIRE thermostats. Their long life, corrosion resistance and repeatability give you long-term economy. They're approved by  ... listed by . Investigate the extra value of Fenwal DETECT-A-FIRE thermostats.



THESE FREE BULLETINS give you the complete facts about Fenwal DETECT-A-FIRE thermostats ... the only units which give you the benefits of the new Rate-Compensation principle of fire detection. Fenwal engineers will be glad to work with you and your system installer so that you, too, can enjoy all the benefits of full fire protection. Write Fenwal, Incorporated, Temperature Control Engineers, 133 Pleasant St., Ashland, Mass.



DETECT-A-FIRE®
Thermostats

DYNAMIC, RATE-COMPENSATED FIRE DETECTION

Flammable Liquids

FLAMMABLE LIQUIDS are divided into three classes by the National Fire Protection Association according to flash points closed cup test:

Class I. Below 25 F:

Ethyl ether, acetone, carbon disulfide, gasoline, benzol, collodion.

Class II. 25 to 70 F:

Amyl acetate, ethyl alcohol, toluol, ethyl acetate, varnish.

Class III. 70 to 200 F:

Stoddard solvents, kerosene, amyl alcohol, creosote oil, turpentine, fuel oil.

Portable containers for Class I and Class II Liquids should be painted red. **Safety cans**, painted red and with self-enclosing spouts are avail-

able in several types in 1 pint to 5 gallon capacity. The larger sizes are equipped with flame arresters to prevent flashbacks.

If several different flammable liquids are handled in one department, stripes or distinct lettering should be placed on the cans to avoid mixing liquids.

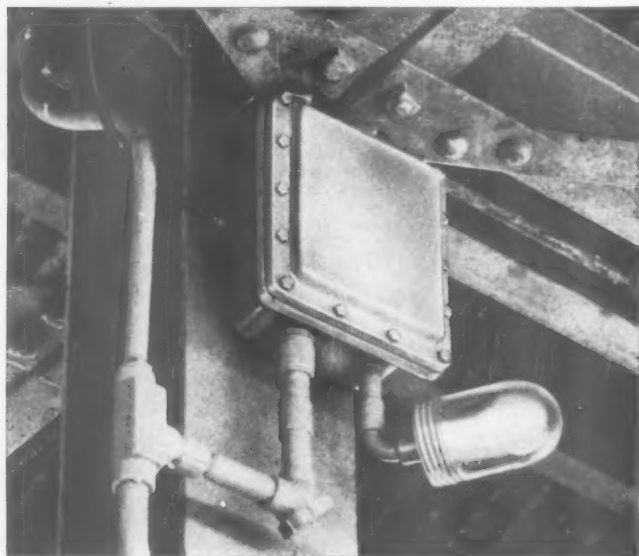
Containers for Class III Liquids should be painted green with the warning label on the sides: "Flammable liquid—Keep fire away and store outside building."

Containers should be kept clean so that the color and lettering will not be obscured.

Tank cars, storage tanks, tank



Fire inspector tests for gas with combustible gas indicator before permitting work in manhole. (Shell Oil Co.)



There are grounds for greater safety . . .

install **ELECTRONIC GROUND INDICATORS**

No bulk plant should be without them. Positive indication for greater protection against static electricity at loading racks and chemical terminals.

***SURE**—be POSITIVE that some wiring break, rust or carelessness is not causing a faulty ground which can lead to FIRE!

***SIMPLE**—installed in the normal grounding circuit, Gilbarco's indicator gives "go ahead" by means of light or audible signal *only when positive ground is established.*

GREATER SAFETY is sound business insurance—write today for full details on Gilbarco Electronic Ground Indicators.

Gilbert & Barker Mfg. Company
West Springfield, Mass. Toronto, Canada

Gilbarco

trucks, connecting pipes and hose lines and filling nozzles should be interconnected with a bonding wire before an attempt is made to open connections during loading or unloading.

When flammable liquids are poured from one container to another, the lip of one container should rest on the edge or lip of the other. The two should be kept in contact during pouring and the receiving vessel should rest on a grounded surface.

Transfer pumps of approved design are desirable when quantities of flammable liquids are handled. These pumps are self-priming and equipped with flame arresters and protected openings for pressure and vacuum relief.

Static Electricity

SPARKS resulting from accumulations of static electricity are a common source of accidental fires. They are particularly dangerous in atmospheres where there may be flammable vapors, gases and dusts.

The hazard is most severe in cold, dry weather. In warm humid weather most surfaces have a film of moisture which helps to draw off static charges. Static charges result from friction between small particles, or from contact and separation of two unlike substances, one or both of which are nonconductive.

Flow of gasoline or other flammable liquids through hose, or dust-laden air through non-conductive passages may produce static charges.

Static electricity is generated on dry belts, particularly on rubber or leather belts by the contact and separation of belt and pulley. Excessive accumulation of static charges

can be prevented by use of conductive rubber belting.

Belts can be grounded with sharp pointed metal combs or metallic tinsel static collectors which are grounded.

Where highly flammable vapors may be present, combs are not recommended. Chain drive or conductive rubber belts with metal pulleys should be used. Conductive belt dressings are helpful but these must be renewed frequently.

Grounding shafting. Shafting and metal pulleys should be grounded with carbon, brass or spring brushes or contacts.

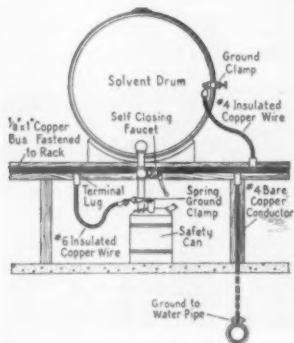
Powdered materials. Finely divided materials falling through the air or blown through pipes may generate static electricity and ignite explosive mixtures of dust and air. Machines should be bonded and grounded at a number of points.

Humidity maintained at or above 60 per cent at 70 F. helps to prevent accumulation of dangerous static charges. High humidity is obtained by special humidifiers or steam jets installed on blower type heaters.

Ionization of air is also used. Ionized air contains electrically charged particles which conduct static charges to grounded parts of machines. Ionization methods include gas flames, discharges of high potential electric current, and radiation from radioactive material. These methods require expert installation and maintenance and may involve fire or health hazards.

Body static charges may create a hazard in areas which contain highly flammable dusts, gases and vapors. Shoes with conductive soles or heels help to drain off the charges. Their conductive value is reduced by foot powders and by wool, silk or nylon socks. Cotton and rayon are safer.

Conductive floors should be installed in hazardous locations but ordinary wax and other nonconductive floor finishes reduce the value of grounding measures.



Method of grounding solvent drums in rack. (Factory Mutual Record)

Pyrene

NEVER PUT OFF

**A PYRENE WON'T STOP CARELESSNESS—
IT WILL KILL FIRES!**




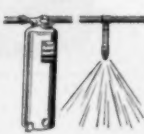


A cardboard locker caught fire in the basement and soon this whole Dayton, Ohio, building was ablaze. Date: January 6, 1950. Loss: \$291,500.

There's a Pyrene for every fire hazard

The right extinguisher at the right time can often prevent enormous losses. Whatever your fire hazard, there's a Pyrene® to cope with it—for Pyrene makes everything from hand extinguishers to complete automatic fire-fighting systems.

*T.M. Reg. U.S. Pat. Off.

 <p>Vaporizing Liquid World's best all-purpose extinguisher.</p>	 <p>Cartridge-Operated For ordinary fires. No annual recharging.</p>	 <p>Chemical Foam For flammable liquids, ordinary combustibles.</p>	 <p>Systems Large and small, manual and automatic.</p>
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PYRENE MANUFACTURING COMPANY
583 Belmont Avenue Newark 8, New Jersey
 Affiliated with C-O-Two Fire Equipment Co.

Defense Against Fire

—From page 179

Any program of fire protection should be in operation around the clock, not the main day shift alone.

Watch service. Watchmen are vital to the protection of industrial property. They discover and correct fire hazards, detect the outbreak of fire, extinguish incipient fires, and call help promptly when needed.

The watchman should be a mature, able-bodied man who is loyal and dependable. During periods when the regular working force is absent the

safety of the plant depends to a large extent upon him.

The watchman should be familiar with all parts of the fire protection system, including sprinkler systems, valves, drains and fire pumps. He should know how to operate extinguishers.

Recorded hourly rounds for watchmen are recommended for most plants. Approved watch clock or supervisory systems give a record of calls at each station.

Fire prevention engineering. Conditions responsible for starting fires and causing them to spread rapidly are avoided by fire-resistant construc-

tion, isolation of hazards, good housekeeping and proper storage for combustible materials.

First step in the control of fire hazards is recognition that they exist. The services of a qualified fire prevention engineer will be helpful in planning measures for both prevention and protection.

Extinguishing Methods

There are many types of apparatus designed for a variety of risks, but all extinguishers are based on one of two fundamental methods of quenching fires: (1) Bringing the temperature of burning material below the kindling point; (2) Depriving burning material of oxygen which supports combustion.

Water Supplies. Water is the most widely used and effective extinguishing medium for most types of fires. Important exceptions are those with electrical equipment, flammable liquids, and in materials where water damage would be excessive.

In determining supply requirements, structural conditions and processes must be considered and the number of streams that might be required to cope with a blaze.

Pumping equipment should be able to supply enough streams at adequate pressure. Allowance should be made for pumps out of service for repairs and for continuity of pumping in event of power failure.

Hydrants should be located throughout the plant area so as to give adequate coverage of all buildings, and preferably not more than 50 feet from any building.

Systematic maintenance is essential. When hydrants are installed, attention should be given to drainage to minimize the danger of freezing in cold weather. Hydrants should be kept clear of snow and a thawing device provided.

Standpipe and hose provide effective protection inside buildings when used by men trained in handling heavy streams. They are a valuable auxiliary to the city fire department. Piping should be of sufficient size for buildings of more than four stories.

WHEN YOU'RE FIGHTING FIRE YOU'VE GOT TO WIN *Early* IN THE FIRST ROUND!



DELIVER THE KNOCKOUT PUNCH WITH *Safety First* DRY CHEMICAL FIRE EXTINGUISHERS!



For In-Plant Protection . . . Trucks . . . Busses . . . Anywhere Fire Can Strike

The first few seconds of a fire are critical . . . make them count with a *Safety First* Fire Extinguisher. Snuff out flammable liquid, gas, oil, grease and electrical fires instantly! Inspected and label serviced by Underwriters' Laboratories, *Safety First* Fire Extinguishers are safe to use, easy to operate, easy to refill. There are no toxic gases or choking fumes, and the dry chemical stream is a non-conductor. Available in the regular industrial type or the revolutionary pressurized *Safe-T-Meter* model with the exclusive visual gauge that tells you when it needs refilling.

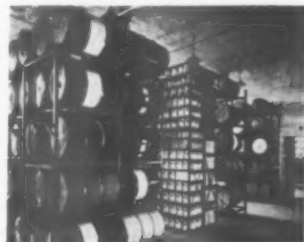
Instantaneous Release Truck Brackets
Available For All Extinguisher Sizes

for further information, write

***Safety First* PRODUCTS CORP., ELMSFORD, NEW YORK**

SAFE-T-METER FEATURES

Approved Underwriters' Rating
Pressure Gauge Tells Extinguisher's Status At A Glance
Can Be Used Intermittently
On-The-Spot Refilling, No Tools Required



Storage racks for drums of enamel and lacquer. Air-conditioning keeps room at a uniform year-round temperature.

Couplings. All outside hydrant nipples and hose couplings should be of the American Standard 2½-inch fire hose thread.

For outside use, 2½-inch single-jacketed rubber-lined hose is ordinarily used. It is flexible and light in weight. Double jacket hose is used principally for the rougher service in municipal fire departments.

Rubber-covered hose is sometimes needed where there is exposure to fumes or corrosive liquids. Synthetic rubber has been found superior to the natural variety for fire hose.

The 1½-inch hose is of great value for small fires and for wetting down fires after the blaze is under control. It can be handled easily by one or two men.

Playpipes and nozzles. Standard underwriters' playpipes throw an effective stream but are difficult to handle, particularly on ladders. The short rigid playpipes with strap and ladder hook, with shut-off nozzles to prevent excessive water damage, are more suitable for plant use.

Adjustable spray and straight stream nozzles (for both 2½- and 1½-inch hose) give water curtain protection for firemen and blanketing effect. They also provide solid streams for penetration.

Water spray (fog) nozzles are effective for oil fires. Water fog, owing to its low conductivity, can be



NO! CURLEY..YOU DON'T HAVE TO BUMP THAT EXTINGUISHER!

To operate an Ansul Dry Chemical Fire Extinguisher you simply remove ring pin, push down puncture lever and squeeze nozzle. No bumping is necessary for mechanical breakage of the dry chemical. When Ansul Extinguishers are pressurized, the jet of high pressure gas instantly fluidizes Ansul "PLUS-FIFTY"® Dry Chemical.

You want properly designed fire extinguishers . . . designed for maximum effectiveness by inexperienced operators, designed for quick, on-the-spot recharge (no tools needed), designed for easy, economical maintenance. . . . You get all this with Ansul Extinguishers. In addition, you get the best fire extinguishing equipment capable engineers can design and a modern plant can manufacture.

SEE PAGE 186

Yes, they had
a Watchman
BUT-

**the WATCHMAN
DID NOT WATCH!**

**Who watches YOUR
watchman?**

Play SAFE

Install the Tamperproof
CHICAGO Watchclock
System



It must be good—it's been used all over the world for many years. The durable CHICAGO system can be installed in a few hours—with a screwdriver! Costs little—lasts a lifetime. . . . Quickly repays its cost because it will reduce your insurance rate!

EXTRA PROTECTION
against FIRE, THEFT
and SABOTAGE.

FILL IN and MAIL NOW

CHICAGO WATCHCLOCK
Div. Great Lakes Industries, Inc.
1524 S. Wabash Ave., Chicago 5
Gentlemen: Send us your folder of details, and prices on the various CHICAGO Watchclock models.

My name.....

Firm name.....

Street.....

City.....

State.....



"The first—and
still the first!"



Top Brass Says I'M GUILTY

In a way that's correct. Guilty of choosing the *wrong* protection. Fire hit and took off like lightning!

There's a moral to this: Protection that's good for one hazard can burn you out when applied to another.

That is why CARDOX years ago originated "Low Pressure Carbon Dioxide Systems"—to give safe protection to industry's "hot spots", for which existing protection just wasn't good enough. Since then thousands of CARDOX Systems have been installed for just about every kind of flammable liquid and electrical hazard you can think of—and scores of Class A hazards as well. *Fire savings to industry total up to many millions of dollars.*

CARDOX applies carbon dioxide as readily in *tons* as in pounds. Under the overwhelming attack of CARDOX CO₂ little fires are snuffed out instantly, big fires almost as fast.

CARDOX' unique experience in low pressure carbon dioxide is at your disposal. A survey of your hazards and our frank report costs you nothing—can be the first step toward turning fire in your plant into an incident instead of a disaster. Write us, please.

*Covered by Patents Issued & Pending

CARDOX
ORIGINATOR OF **Low Pressure CO₂**
FIRE EXTINGUISHING SYSTEMS

CARDOX CORPORATION • BELL BUILDING • CHICAGO 1, ILLINOIS
Offices in Principal Cities

used safely on electrical fires. Its effective range is limited to a few feet but this can be offset to some extent by using applicator pipes of varying lengths.

Foam-generating equipment is used where large quantities of flammable liquids are stored. For some exposures permanent generating equipment should be installed.

Foam systems may be either automatic or manual in operation. There are two types of foam, chemical and mechanical.

Chemical foam is formed by a chemical reaction in which masses of bubbles of carbon dioxide gas and a foaming agent produce an expanded froth.

Mechanical foam consists of bubbles of air produced when air and water are agitated mechanically with a foam solution.

Several types of foam nozzles now available produce foam to combat different types of fires.

Limiting Fire Areas

Fire Doors and Shutters. For large buildings, fire-resistive partitions with fire doors are important in confining fire to a limited area. Several types of doors with varying degrees of resistance have been approved by testing laboratories.

Fire doors should either close automatically each time they are opened or be closed by a heat-actuated device if fire should break out. The most common device is the fusible link.

The releasing device should be located where it will be affected quickly by heat passing through the doorway and it should be protected against mechanical injury.

Where flash fires may occur, quick operating devices are preferable, except for doors used as exits.

Fire shutters are used for windows where there is an exposure hazard from adjacent buildings. Shutters may be of the swing type (tin clad or steel) or rolling steel. The latter type can be installed where space is too limited for swinging shutters.

Sliding shutters are not recommended where snow and ice might interfere with their operation.

These Should Be Reported To the F.B.I. . . .

1. All attempts at espionage.
2. All attempts at submarine or parachute landing of personnel.
3. Individual or group possession of foreign propaganda.
4. Large caches or supplies of guns and ammunition.
5. All attempts to poison or infect municipal water supplies and sources.
6. Fires or explosions that indicate sabotage.
7. Evidence of radioactive materials in possession of unauthorized individuals or groups.

The Medical Department

THE PHYSICIAN and the safety director share the responsibility for protecting the worker against the risks of injury on the job and occupational diseases.

Care of the injured worker was the first responsibility assigned to industrial medicine. Its importance in that field is universally recognized but its activities have expanded enormously.

Conservation of manpower is aided by (1) Proper placement of employees through pre-employment examinations; (2) Continued supervision of employee health through periodic check-ups, particularly in health-hazardous occupation; (3) Supervision of plant processes.

Introduction of new processes and new materials with actual or potential health hazards has brought new problems and opportunities to the medical department. To study and control health hazards, some large corporations maintain industrial hygiene laboratories. Smaller companies obtain help from insurance carriers, state departments, and private consultants.

Scope of the Program

Industrial medical service requires a definitely organized plan, set up by a physician with management's full support. Essentials of such a program are:

1. A staff of qualified physicians, nurses and attendants adequate for the needs of the organization.

2. Dispensary and hospital facilities conforming to standards established by the American Medical Association, American College of Surgeons and the American Association of Industrial Physicians and Surgeons.

3. Efficient care of occupational injuries and diseases.

4. Reasonable first-aid treatment for non-occupational injuries and illnesses while on the job.

5. Physical examinations — pre-employment and periodic.

6. Adequate records of treatments and individual medical histories. The latter should be kept confidential.

7. Supervision of plant sanitation and hygiene measures.

8. Instruction of employees in personal health and safety.

Hospitals. Use of approved public hospitals, where available, is usually more desirable than setting up elaborate facilities for surgery and treatment of serious cases. During World War II hospital facilities in many communities were overtaxed and this led to the expansion of many plant hospitals.

The medical director. Health and medical services should be under the supervision of a physician. Management and the medical director can formulate workable policies. Medical assistants, consultants, nurses, and others, should be selected on the recommendations of the medical director.

Full-time service of a physician may be warranted by the size of the plant or the nature of its operations. Sometimes a plant physician engages in private practice with the company's approval. He may devote part of his time to the industrial organization, assuming supervisory responsibility and delegating detail work to qualified assistants.

For Smaller Plants

Part-time service. For a plant not large enough to warrant a full-time medical director, a part-time arrangement may be the solution. A physician who is present only part of the day should have definite hours at the plant.

With such an arrangement it is desirable to have a full-time nurse in attendance so that treatment will be carried out and complete records kept. The nurse is responsible to the physician and works under his direction.

Some plants employ medical service on a call basis, the doctor being

summoned only in emergencies. This is the least satisfactory type of service. Under such a setup, the physician is not likely to develop a real interest in the company, nor will he be able to do effective educational work.

Cooperative services. Where several small plants are close together, a cooperative medical service program can often be carried on successfully. A central dispensary with the necessary personnel and equipment is maintained. Adequate service can be made available at moderate cost.

Physical Examinations

Pre-employment examinations have become standard procedure in many companies. Their purpose is to place each employee in a job suited to his capacity rather than to bar any one from a job. Periodic checkups are desirable, particularly for elderly employees, for those in jobs where safety depends on physical fitness, and where there is exposure to health-hazardous materials.

Examinations include vision, heart, chest, blood pressure, hearing and urinalysis. Tests in some industries require rather elaborate laboratory facilities.

Laboratories. For most industries, facilities for taking urine tests and blood counts are needed. Blood serum samples can be sent to a local or state laboratory for analysis. Where a large volume of toxicological tests is conducted, a complete laboratory at the plant may be desirable.

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Records of all dispensary cases are useful to both medical and safety departments.

Treatment of Injuries

PRELIMINARY treatment of injuries and sudden illnesses that occur on the job can prevent minor cases from becoming serious and avoid a great deal of lost time.

Wherever possible, treatment should be administered by a physician or nurse. Companies with extensive first-aid training programs do not permit a layman to give treatment if a doctor or nurse is available. The training is strictly for emergency use.

However, most injury cases, both in the plant and outside, are handled by laymen. Many a life has been saved because some person knew how to check bleeding, apply resuscitation, treat shock, or splint a fracture.

Two world wars have extended the training of laymen in first-aid techniques and proved the value of such training. Many men have received excellent training in the Army and the Navy. Many others have been trained by the American Red Cross and the U. S. Bureau of Mines.

Adequate treatment of injuries requires:

1. Competent attendants
2. Clean, convenient quarters
3. Medically approved equipment and supplies
4. Proper organization
5. Well-kept records

This discussion is concerned with the needs of plants which employ a full-time nurse and part-time physician rather than those with medical staffs and hospital facilities.

Personnel. First-aid facilities should be under the supervision of at least a part-time physician. A full-time registered nurse is desirable, even in a medium-sized plant.

If a full-time nurse is not practicable, at least two employees who have completed standard first-aid courses should be selected to carry on the work. They should be under the supervision of a doctor or a nurse.

Attendants should be allowed sufficient time from their jobs to keep the first-aid room in order, check supplies, and keep the necessary records. One attendant should be available during all working hours.

Dispensaries

A separate room should be provided, if possible. Patients should have reasonable privacy. If it is not practicable to partition the dispensary into a waiting room and a treatment room, a screen can be used.

The utmost cleanliness of equipment and surroundings should be maintained. The color scheme has an important psychological effect on patients. For walls and ceilings, light tints in washable semi-gloss enamel are practical and cheerful. White is no longer considered necessary for hospitals and dispensaries.

The first-aid room should have:

1. Good lighting
2. Adequate ventilation and comfortable temperature
3. Basin with hot and cold running water
4. A quiet location
5. Floors of durable and easily cleaned material
6. Toilet facilities

Equipment. For a dispensary with a registered nurse in charge under the supervision of a part-time physician, equipment might include:

1. Two white enameled chairs and a bench
2. Enameled top table or desk
3. Stool
4. One or more beds or cots
5. Linen and blankets
6. Waste can with cover
7. File for medical records
8. Floor lamp
9. Treatment table and instrument cabinet
10. Medicine chest
11. Small sterilizer
12. Small items of office and surgical equipment, such as basins, pitchers, rubber gloves (sterile), scissors, tweezers, forceps, hot water bottle, ice bag
13. Stretcher
14. Telephone

Supplies. Any list should be regarded as a guide. The supervising physician should be consulted, particularly when any medication is involved, such as first-aid antiseptics and burn dressings.

It should be remembered that the supplies and instruments are likely to be used by laymen and the whole setup should be as simple as possible.

Individual package dressings, kept in sterile wrappers until used, and first-aid antiseptics in ampoules are

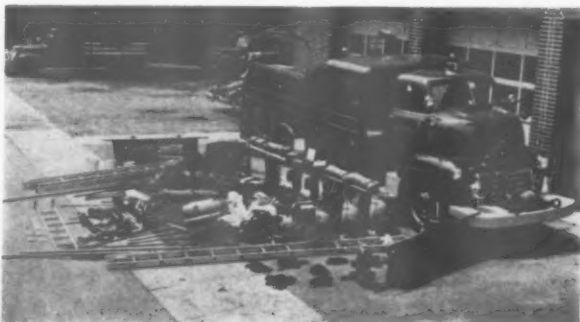
preferable when supplies are not used in large quantities and where laymen handle the cases.

Suggested items are:

1. Absorbent cotton, preferably in covered dispenser
2. Gauze bandages
3. Finger compresses
4. Dressings for burns
5. First-aid antiseptic
6. Roll of 1-inch adhesive tape
7. Safety pins—assorted sizes
8. Applicators
9. Teaspoon
10. Paper drinking cups
11. Medicine droppers
12. Aspirin or other analgesic
13. Boric acid—4 per cent solution
14. Bicarbonate of soda
15. White wine vinegar
16. Aromatic spirits of ammonia
17. White petroleum jelly
18. Scissors
19. Paper or individual cloth towels
20. Tissues
21. Liquid soap in dispenser
22. Tourniquet

Dispensary records. Accurate records should be kept of all treatments. If injuries are infrequent, a small day book may be sufficient, if kept systematically. Entries should include these details:

1. Date and time of injury.
2. Date and time injury was reported for treatment.
3. Name of injured.
4. Address of injured.
5. Where and how injury was received.
6. Names, addresses and telephone numbers of witnesses.
7. Nature of injury.
8. Kind of treatment given, and by whom.
9. Whether employee returned to work after treatment; if not, when.



Mobile land rescue unit and equipment maintained by Lakewood, N. Y. Funds to purchase and equip the unit were raised through donations and social functions in this community of 2,944. Its services are available to any community in Chatauqua County. (Mine Safety Appliances Co.)

First-Aid Antiseptics

Infection of an open wound can be prevented by killing the germs already present or by removing them mechanically and preventing the entrance of more. It is in this second theory that soap and sterile water are used in aseptic treatment of wounds. Careful and thorough washing with soap will mechanically remove the organisms and a sterile bandage will prevent entrance of more. Very few are destroyed in the process.

Many substances will kill germs in a test tube but a successful first-aid antiseptic must kill them in the presence of body substances and not kill too many of the body cells at the same time. Choosing the proper one is something of an art and for this reason should be left to the doctor in charge.

Corrosive sublimate, for instance, is an antiseptic mercury compound and very effective except for its bad effect on tissues. Compounds such as merthiolate, merphenyl and merurochrome are devised to get the antiseptic properties of mercury without its toxic effects.

The halogens (tincture of iodine and Dakin's solution) have been widely used because of their strong oxidizing action. They are even stronger than hydrogen peroxide which is used for the same reason.

The various antibiotics (sulpha compounds, penicillin, terramycin, and so on) are not antiseptics although they are very useful in treating infections. They should not be used in first aid because their use is not without danger.

First-Aid Kits

A kit located in a convenient corner of the plant is permissible only for a small plant. With a competent and conscientious employee in charge, it can be helpful. An unsupervised kit, however, is of doubtful value. Employees help themselves, often for home use, and soil materials they do not use. Labels fall off, leaving contents of packages unidentified. Some supplies deteriorate with age.

Self treatment should be discouraged. A trained and responsible person should be in charge. Locking the kit is not a desirable precaution. The key may be lost or the person who has it may be away in an emergency.

An ideal location may not be available but the best possible spot should be chosen. It should be readily accessible to the working zone. More than one kit may be desirable.

Following are essential for a location:

1. Lavatory with hot and cold running water
2. Toilet facilities
3. Convenience for supervision and maintenance
4. Reasonable privacy for the patient

Supplies may be selected from those suggested for dispensaries, bearing in mind the limitations of space and the requirements of the plant.

Essential items of equipment are:

1. Desk or table for filling out records and reports
2. Chair or stool
3. Filing case for records
4. Waste can with cover
5. Bulletin board

A first-aid manual should be kept on hand so the first aider can refresh his memory on details and check procedure.

Resuscitation Methods And Equipment

PROMPT application of artificial respiration by persons trained in first aid has saved thousands of lives in cases of suspended breathing due to asphyxiation, drowning, electric shock and other causes.

The Schafer prone pressure method has been widely used for many years. It is easily learned and can be applied immediately, which is important in all cases of suspended breathing.

Other methods are receiving careful study. Among these, the back pressure arm-lift and back pressure hip-lift methods have been found highly effective.

Mechanical resuscitators accepted by the American Medical Association are used by fire departments, hospitals and by some industries where asphyxiation or electric shock hazards are serious and where apparatus and trained personnel are immediately available. Such apparatus can be used where injuries to the patient might prevent use of manual resuscitation. It also gives more air exchange and does not get tired.

Mechanical resuscitators are for use only by persons trained in their operation.

The **Inhalator**, which supplies a mixture of 93 per cent oxygen and 7 per cent carbon dioxide to the



Rescue squad of Cleveland Fire Department uses inhalator on asphyxiation victim. This apparatus, used in conjunction with artificial respiration, supplies a mixture of 93% oxygen and 7% carbon dioxide. It may be used with other resuscitation methods.

patient, is used with manual resuscitation. It is particularly valuable in cases of gas asphyxiation. The inhalator, by itself, does not produce respiration and should not be confused with mechanical resuscitators.

Some types of apparatus combine the functions of resuscitator, inhalator and aspirator, restoring breathing, administering oxygen-carbon dioxide, and removing from the throat secretions which might hinder breathing.

The "Eve" or rocking method uses a stretcher over a support on which the patient is see-sawed up and down. This method is used by the British Navy and the U. S. Coast Guard. A folding stretcher and support can be carried in an automobile.

Application of manual resuscitation should never be delayed while waiting for apparatus.

First Aid for Isolated Groups

WHERE MEN must work at some distance from medical help, laymen must assume greater responsibilities for the care of the injured than in the factory. Miners, oil field workers, construction gangs, lumbermen, truck drivers, and train and boat crews come under this classification.

In such operations as many men as possible should be trained in advanced first aid. In the mineral industries thousands of men have been trained by instructors of the U. S. Bureau of Mines. Equipment should be chosen with regard to the hazards likely to be encountered.

An emergency kit carried on the person should contain:

1. Sterile gauze in individual dressings.
2. Two 1-inch and two 2-inch roller bandages.
3. Sterile compress bandages in individual packages.
4. One triangular bandage.
5. Tourniquet.
6. Safety pins.
7. Aromatic spirits of ammonia—3 ampules.
8. Dressings for burns.

If the kit is carried on a car or truck, splints should be added.

Snake-bite kits should be included in the equipment carried in snake-infested country.

Transporting the Injured

Where there is any doubt about moving the patient, medical aid should be brought to the scene of the accident, if at all possible. Lifting a patient into a car may aggravate injuries.

Before the patient is moved he should be treated for possible shock. Fractures should always be splinted.

Stretchers. The army type is easy to handle. It can be used as a cot at the scene of the accident, in tran-

sit, and at the first-aid room or hospital.

Collapsible stretchers may be folded when not in use and carried in an automobile.

Bandages, splints and stretchers may be improvised in emergencies when regular equipment is not available. Improvisation is part of first-aid training. Where men are at work, however, approved first-aid equipment and supplies should be kept on hand.

The Medical Department

—From page 199

Vision. Several devices for testing visual acuity and classifying workers for jobs are available. These devices can be used by trained laymen. Employees showing visual defects are referred to ophthalmologists or optometrists for further tests.

Hearing. By means of the audiometer, acuteness of hearing can be determined and treatment indicated. Any progressive loss of hearing, through noisy work or other causes, can be measured.

Chest. For many occupations, pre-employment and periodic examinations include X-rays of the chest. Mass chest surveys are made at regular intervals in industries where

health hazards require frequent checks, and in public health campaigns to detect incipient cases of tuberculosis.

Trained technicians with mobile equipment can be engaged to conduct mass X-ray surveys.

Consultants

The medical director, like the private practitioner, is not an expert in all branches of medical sciences. Both find it necessary at times to call on specialists when diagnosis is uncertain or treatment requires specialized techniques.

Surgeons. In all surgical cases where there is danger of inaccurate diagnosis or inadequate treatment, outside consultation should be called in early. Frequently, the administrative and diagnostic ability of the medical director is more important than his skill in surgery. The plant physician should refer all cases which might be beyond his training and experience to a specialist or surgeon.

Oculists. Injuries to the eyes are among the most frequent of occupational injuries. The importance of the eyes is so great that highest available skill should be secured. Specialists should be summoned in all potentially serious cases.

The oculist can also serve industry in correcting defective vision among

employees. The employee should, of course, have the privilege of choosing his own oculist or optometrist but frequently he will ask the advice of the medical department on the selection of a specialist. Where prescription goggles are indicated, some companies provide the examination.

Dentists. Injuries to the teeth are relatively infrequent in industry and such cases are usually sent outside for treatment. The medical department should have a list of dentists qualified to treat such injuries.

The importance of oral hygiene has led many companies to provide dental examinations, sometimes including full-mouth X-rays. The findings are usually referred to the employee's dentist since few companies provide restorative dentistry.

Health Agencies

Among the agencies furnishing helpful data on general and specialized phases of medical service, first aid and industrial hygiene are the following:

United States Public Health Service
United States Department of Labor
American Standards Association
Industrial Hygiene Foundation
Atomic Energy Commission
State and Municipal Health Departments

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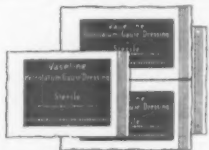
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MEDICAL FACILITIES

Recommended Standards

1. In plants of 500 or more, a full-time nurse should be in attendance. A physician should be present at the daily dressing hour.
2. Number of treatment rooms:
50 to 500 employees..... 1
500 to 1000 employees..... 2
1000 to 5000 employees.... 3
5000 to 10,000 employees... 5
3. For plants of more than 1,000 employees the dispensary should be equipped with bath and toilet, equipment for minor surgery, and other apparatus and supplies selected by the physician in charge.
4. One or more beds should be provided where severe cases may be made comfortable during observation or while waiting for transportation to a general hospital.
5. An X-ray room, if facilities are not available in a local hospital or physician's office.
6. The hospital should be under full charge of the company physician.

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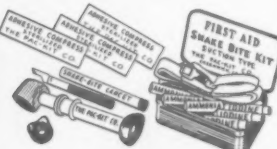
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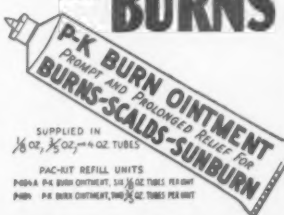
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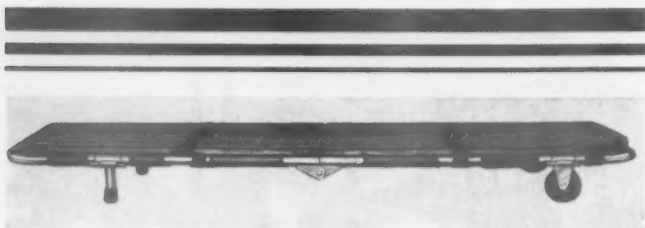
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Surgical Cleanliness in The First-Aid Room

SUCCESSFUL PRACTICE of first aid requires adequate sterilization of surgical materials and rigid precautions during treatment and until the wound is healed.

To the physician and nurse, keeping equipment and supplies free from contamination and cleansing the hands thoroughly has become second nature. But the first-aid attendant who may be called from his job to treat an injury sometimes overlooks important precautions.

The first-aid room should be quiet and away from odors, including cooking. Good ventilation is essential. Windows should be screened to keep out insects. In summer screen doors are also advisable. Flies and other insects should not be tolerated.

Furnishings should be simple and neat and the room should not be cluttered. Walls painted with egg-shell enamel in a light tint of green, cream or buff are satisfactory. A patient who is nervous or in a state of shock may be upset still more by intricate patterns on walls and ceilings.

The floor should be resilient and easy to clean. Linoleum, rubber tile and asphalt tile are satisfactory. No feather duster should be used on the furniture and no dry sweeping. Damp cloths for dusting and a sweeping compound avoid raising dust. A vacuum cleaner with floor brush attachment is also good.

Supplies (bandages, gauze, instruments, etc.) should be kept in cabinets. Gauze and bandages as purchased in packages are sterile. Unit dressings are particularly desirable when treatment is performed by laymen. There is no waste and contamination of unused supplies and, as in the case of finger compresses, it is possible to apply dressings without touching the part which comes next to the wound.

Sterilizers are used to sterilize instruments such as forceps, tweezers, etc., by subjecting them to boiling water or live steam. Boiling for 10 minutes is advised.

When treatment is concluded, instruments should be cleaned and sterilized and allowed to dry. Soiled dressings should be disposed of out of sight of patients. A closed can with self-closing foot-operated cover is a useful item.

Hands cannot be made absolutely sterile but reasonable standards of personal cleanliness should be maintained. While the packet system permits persons with dirty hands to apply a sterile dressing without contaminating it, only an emergency would justify it.

For the first-aid room, clean towels (cloth or paper) and soap, preferably liquid or powdered in a dispenser, should be available. A nail brush should be used.

If extensive dressing or cleansing

of a wound is indicated, the patient should be placed in a comfortable position and the injury covered temporarily, after any severe bleeding has been checked.

Wash-up then proceeds as follows:

1. Clean finger nails by scrubbing with soaped brush and warm water, up and down the nails and across the finger tips.

2. Then scrub inside of hands and between fingers.

3. Then outside of hands and arms beyond the elbow. A short-sleeved shirt or jacket is recommended.

4. Rinse so that water runs off the elbows. Finally, wash with a sponge dipped in alcohol.

Patient's clothes or hands should not be allowed to come in contact with a wound during or after treatment. Wounds may also become infected from the nose or throat of the patient or the attendant.

The First Aider And the Doctor

To retain the respect of the medical profession there are some things the first aid attendant should do and many things he must not do. The following hints have been suggested by the Industrial First Aid Attendants Association of British Columbia:

Don't specifically recommend any doctor to a patient unless definitely asked to do so. Ask the patient who is his family doctor and arrange accordingly. If he has no family doctor, make it plain to him that he has his choice of the medical help available locally.

Of course, in cases of extreme emergency you will use your own judgment in obtaining medical assistance as quickly as possible.

Don't suggest that a patient needs any particular treatment, or requires X-ray or lamp treatment, for instance. The doctor will decide.

If a workman comes to you to dress an injury which has been previously treated by a doctor, don't superimpose your treatment on the doctor's. Either get the doctor's permission and instructions, or send the man back to him should further treatment be indicated.

You will often be asked by workmen for advice as to treatment of their private ailments. Be very careful how you act under such circumstances. Don't make specific recommendations or attempt to diagnose, refer the enquirer to his family doctor.

Don't stock "medicines" in the first aid room; restrict supplies to those necessary for first aid to the injured.

Remember your limitations and avoid accepting responsibilities that are not rightly yours.

When calling a doctor to an accident endeavor to give him as full and intelligent a report of the pa-

There's a HALCO HEAVY DUTY KIT for Every Need



HALCO HEAVY DUTY UNIT FIRST AID KITS

are made of heavy gauge steel and are furnished with standard size unit packages containing a complete assortment of First Aid items. Each Kit is furnished with an illustrated instruction sheet and each package has a full description of contents and illustrated method of application plainly printed on the outside.

Assortments can be made to your specific requirements upon request.

Further information, descriptive literature and prices will be furnished upon request.

A. E. HALPERIN CO. INC. BOSTON 18, MASS.

Pick your
6 employees
who have had
most accidents



Don't tell them what it's all about—just let our man test their eyes (the test takes less than four minutes).

A large percentage of workers with high accident and spoilage rates are handicapped by defective vision.

Thousands of plants have found that they simply cannot afford to hire a worker without testing his eyes. Periodic re-checking also pays them handsome profits.

Write us for a sample test of a few of your below-average employees—or for Bulletin N.

KEYSTONE VIEW COMPANY, Meadville, Penna. Established 1892. Originators of Binocular Vision Testing in Industry.

KEYSTONE Occupational Visual Service

tient's condition as possible, e.g., the extent of shock; if there has been excessive hemorrhage, or if there are signs of internal hemorrhage; if any concussion, or any degree of insensibility; pulse and respiration should be noted, and, in fact, any indications suggesting urgency in medical treatment, as well as the history of the accident or its salient features. Such details will give the doctor a picture of the case and be of great help to him.

Safety's HONOR ROLL

Current records of operation exceeding 500,000 man-hours without a disabling (lost-time) injury are invited for this department. For records of one year or more a minimum exposure of 300,000 man-hours is acceptable.

American Cyanamid Co.

Azusa, Calif., Plant—October 1, 1949, to January 1, 1952; 591,772 man-hours.

Bound Brook, N. J., Plastic Div.—December 30, 1948, to January 1, 1952; 1,575,420 man-hours.

Heller & Mertz Plant, Calco Chemical Div., Newark, N. J.—October 5,

1949, to January 1, 1952; 1,082,760 man-hours.

Ingersoll, Ont., Quarry, North American Cyanamid Ltd.—July 11, 1947, to January 1, 1952; 767,655 man-hours.

Latrobe, Pa., Plant—September 16, 1943, to January 1, 1952; 2,566,138 man-hours.

Piney River, Va., Plant, Calco Chemical Div.—December 19, 1950, to January 1, 1952.

Willow Island, W. Va., Plant, Calco Chemical Div.—March 21, 1950, to January 1, 1952.

American Steel Foundries

Cast Armor Div.—January 17 to September 4, 1951; 773,794 man-hours.

Bethlehem Steel Co.

Johnstown, Pa., Plant—August 22 to October 22, 1951; 5,509,743 man-hours.

Bethlehem, Pa., Plant—November 25 to December 31, 1951; 4,452,181 man-hours.

British Columbia Electric Railway Co., Ltd.

Vancouver, B. C., Substation Operating and Maintenance Dept.—July 20, 1950, through December 31, 1951; continuing.

Corn Products Refining Co.

Argo, Pekin, Kansas City and Corpus Christi Plants—September 24 to November 17, 1951; 1,550,014 man-hours.

Crucible Steel Co. of America

Midland, Pa., Works—September 11 to November 23, 1951; 2,982,000 man-hours.

General Petroleum Corp.

Oregon Div., Marketing Dept.—September 29, 1950, through December 31, 1951; 609,027 man-hours; continuing.

Washington Div., Marketing Dept.—September 6, 1950, through December 4, 1951; 878,103 man-hours.

Heintz Manufacturing Co.

Philadelphia—October 23, 1951, to January 16, 1952; 1,243,063 man-hours.

Long Lac Pulp & Paper Co., Ltd.

Terrace Bay, Ont.—January 9 to July 21, 1951; 728,825 man-hours.

Mathieson Chemical Corp.

Baltimore Plant—July 1, 1951, to January 11, 1952; 1,003,347 man-hours.

Mead Corp.

Kingsport, Tenn., Div.—October 5, 1951, through February 11, 1952; 1,059,606 man-hours; continuing.

Nekoosa-Edwards Paper Co.

Nekoosa, Wis., Mill—August 19, 1951, to January 18, 1952; 545,962 man-hours.

J. P. Seaburg Corp.

Chicago—1,250 employees; 1,072,181 man-hours.

Joseph E. Seagram & Sons, Inc.

Old Farmer's Distillery, Athertonville, Ky.—July, 1948, through December 31, 1951; 658,641 man-hours; continuing.

Joseph E. Seagram & Sons, Louisville, Ky.—April 2, 1951, through September, 1951.

Hunter-Wilson Distilling Co., Bristol, Pa.—November, 1950, through December, 1951; continuing.

Joseph E. Seagram & Sons, Lawrenceburg, Ind.—September, 1950, through February 20, 1951; 1,369,501 man-hours.

Calvert Distilling Co., Relay, Md.—August 1951 through November 24, 1951; 575,217 man-hours.

Blair Distilling Co., St. Francis, Ky.—December, 1943, through December 31, 1951.

Standard Oil Co. (Ohio)

Sohio No. 1 Refinery, Cleveland—289 days; 1,276,000 man-hours. The refinery was the winner of Sohio Safest Refinery Flag for 1951.

Swift & Co.

Union Packing Co., Calgary, Alta.—427 days; 820,405 man-hours, ending May 1, 1951.

Corkran Hill & Co., Baltimore—195 days; 590,993 man-hours, ending March 13, 1951.

Derby Foods, Inc., Chicago—221 days; 524,318 man-hours, ending June 25, 1951.

Swift Canadian Co., Ltd., Edmonton, Alta.—136 days; 611,983 man-hours, ending September 29, 1951.

Evansville, Ind.—99 days; 549,751 man-hours as of December 29, 1951; continuing.

—To page 264

EMERSON Resuscitators

SIMPLE to operate.

SAFE for adults, children, or infants.

ACCEPTED by the American Medical Association since 1942 for use by laymen.

PROVIDE SUCTION, alternating with pressure, to give vital aid to the circulation. Write for free Medical References on Resuscitation.

NOTE: The first few minutes after breathing has ceased are the most critical. Manual artificial respiration should be started immediately and continued until the resuscitator is in use. Write for free bulletin Emerson Method of Artificial Respiration.

J. H. EMERSON CO.

Cambridge 40, Massachusetts

"Simplest and Safest"



Training Materials

SAFETY TRAINING AIDS of many kinds have been developed for industrial education and the promotion of safety-conscious attitudes on the part of workers.

Throughout his employment, the workman's personal welfare and his value to the production team can be influenced favorably by use of the numerous devices of mass communication created for the first of safety's famous "three E's"—Education.

Safety rule books are among the first items used by many firms as part of the induction procedure. Types range from simple, home-made mimeographed sheets or leaflets to elaborate books, made attractive with color and illustrated with cartoons, drawings and photographs.

Films may acquaint the recruit not only with the safety program but also with essential facts about the company and its aims. The newcomer will see film presentations at the beginning and throughout his employment as this effective medium is used for training at different steps in his career.

The worker is already conditioned for this means of communication, which combines the perceptions of sight and sound in a form that makes a lasting impression.

Types include strip films that present individual frames by projection, as the voice of the instructor adds the commentary; sound slidefilms

that use a similar strip with a disc or tape recorded commentary; separate projection slides used with either live voice or record; silent movies and sound movies.

Safety films covering specific hazards and different industrial operations as well as training films covering every kind of activity are available from the National Safety Council and from many other sources.

Posters with splashes of color and pertinent safety messages will be seen by the worker as he is escorted through the plant to meet his foreman, who will direct his initial training and supervise his work. Week after week he will see new posters, covering various hazards and relating to different safety themes. These graphic displays will inform and remind, and often they will amuse, since the creators of safety posters have learned that the light touch can be most effective in dealing with this serious subject.

Each new poster offering will get the worker's conscious attention in the beginning. After that, each time his glance falls on the design, another impression will be recorded on his subconscious mind, building his safety attitude. It is this factor of repetition that has proved the re-

markable power of the poster in influencing behavior.

Safety instruction cards, covering the hazards of practically every type of industrial operation as well as seasonal and off-the-job subjects, may be handed to him by his foreman as part of the training program or as pertinent reminders of specific hazards connected with his job.

Bulletin boards in prominent locations around the plant will carry many of the above posters, charts and cards, as well as announcements, photographs of accidents or hazardous situations, displays of protective articles that have saved life or limb for fellow workers, personal items and other trivia that will attract the interest of the employees.

Safetygraphs are special graphic training aids for use by foremen and other teachers in training groups of workers in specific phases of safety. These are collections of drawings, cartoons, charts and other illustrations, printed on heavy paper and spiral-bound in a folder that opens to form an easel. With the large illustration facing the audience, the foreman discusses the subject portrayed, using his own words or reading the suggested talk printed on the back of the page facing him.

Exhibits of various types of safety equipment, personal protective devices and the like are shown to the new worker in many plants to impress upon him the importance of safe operation and the extensive precautions taken by the company to protect him.

Safety score charts, home-made or available in poster services, will remind him of the accident record—or bolster his pride in the plant no-accident record.

Illustrated Safety Talks, similar in format to the Safetygraphs but smaller in size, now are being produced for similar use.

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REFERENCES

- Safety Promotion and Training
Maintaining Interest in Safety—Safe Practices Pamphlet 67, NSC.
Teaching Safety to New Employees—SPP 65, NSC.
Safety Contests—SPP 74, NSC.
More Power to the Voice of Safety—N. S. News, May 1949, p. 24.
To Get an Audience, We've Got to Be Good, by M. R. Freeman, N. S. News, July 1949, p. 30.
Safety's Little Teachers, by Horace E. Hedger—N. S. News, May 1951, p. 34.
Industrial Accident Prevention Signs—SPP 81, NSC.
Industrial Accident Prevention Signs, Specifications for, Z35.1-1941—American Standards Assn.
Lines of Communication, by Robert Clair—N. S. News, Jan. 1952, p. 30.
The Education of a Safety Man, by Glenn Griffin—N. S. News, Jan. 1952, p. 24.



Jumbo posters on boards in conspicuous spots reach both employees and public.

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Safety Signs

SIGNS are among the oldest of all methods for conveying information. They are simple and most effective in the safety effort, as they warn of hazards, direct, regulate and educate. Even to the illiterate their meaning should be clear and their message should be conveyed at a glance.

Response to the directions of signs is practically automatic, as we have been conditioned to them throughout our lives.

Dominance of a sign is the result of contrast with its surroundings. This is achieved through a combination of shape, color, wording and location. Recognition of these factors has led to the adoption of standards that promote uniformity in design and color for signs that fall into various classifications. When both commercial and home-made signs conform to these standards, they will be recognized instantly as referring to certain hazards.

According to the American Standards Association code, characteristic colors for signs should be:

1. Danger—Red.
2. Caution—Yellow.
3. Safety instruction—Green.
4. Direction—Black.
5. Information—Any combination of colors, except red and yellow.

Visibility of warning signs is a first requisite. Special illumination may be necessary in poorly lighted areas.

Black on white and black on yellow are the most visible combinations. Other combinations are white on black; yellow on black; dark blue on yellow; red on white; blue on white; white on blue.

Yellow is regarded as the most conspicuous color in daylight; red can be seen most readily by artificial light.

Red is universally accepted to denote danger or fire apparatus. This should always be considered in choosing color combinations for danger signs. Its force should not be weakened by indiscriminate use.

Color combinations that contrast with surrounding colors should be used so they will stand out clearly. Use only permanent colors.

Location is an important factor, and the effect of a warning sign is wasted if it cannot be seen easily or if it is too far from or too close to the real point of danger.

Wording of signs should be brief, clear and understandable to persons with limited vocabulary.

Wherever the nature of the hazard may not be evident, the sign should if possible specify the danger, such as "Gasoline Storage."

The shorter the wording the better, but many people resent too brusque an order, however impersonal it may

be. The best sign will, if it expresses more than a mere stereotyped phrase, like **stop** or **slow**, invite cooperation rather than demand conformity.

Lettering should be as large as possible, consistent with balance and legibility. Block letters are recommended for ease in reading.

The weight of line in the body of each letter should be about the same as the spaces between the lines.

Tables of distances at which well proportioned letters can be read by persons of normal vision under good lighting conditions are given in the American Standards code referred to above. This code also offers detailed specifications on sign construction of the standard types.

Danger signs should be restricted to such immediate and serious hazards as high voltage equipment, toxic and corrosive chemicals, collision hazards, explosives, etc. Employees should be warned of their importance.

Caution signs warn employees against potential hazards, such as improper use of elevators, cluttered aisles, and sparks from grinding wheels; or against unsafe practices such as oiling machinery in motion, smoking in forbidden areas, and operating machines with detached guards.

Workers should learn to respond to a caution sign as an indication of potential danger requiring care and alertness. The difference between the danger sign and the caution sign is one of degree.

Other general types include safety instruction signs, which designate certain actions or practices, directional signs, and information signs.

Maintenance. Periodic inspection and inventory of signs should be part



A suggestion system, backed by recognition and other rewards, yields safety ideas.

of the safety program. Signs should receive the same cleaning and maintenance that is given to other equipment. Dirty and disfigured signs are not convincing.

Signs which are no longer needed should be removed. Where hazards have changed, signs more appropriate to present conditions should be substituted.

Warning tags come in a variety of stock subjects. They are attached to equipment in emergencies to warn others that men are working on machines, that a valve on a pipe line has been shut because of a leak, etc. They are also used on unsafe equipment which is to be removed from service.

Safety decals are miniature signs which can be attached permanently to machines, walls or other places where a message of warning, caution or brief instruction is needed. They conform to the standard specifications of design and color.

Signboards with changeable letters are available in small sizes suitable for departmental use and larger types which may be erected in conspicuous places near the plant entrance where they can be seen by both employees and the public.

These boards may be used for brief safety messages and for recording the plant's record of no-accident days.

Awards

From the beginning of organized safety work, group and individual awards for safety accomplishments have been widely used. For plants and departments, plaques, trophies and banners are often presented. For individuals, automatic pencils, wallets, key rings and lapel buttons are among the popular items.

These awards are available in a variety of stock designs or distinctive ones can be made to order.



Warning tags for a variety of jobs should be in convenient place. (Westinghouse)

SERVICE GUIDE

2.1

February 1, 1952

**NATIONAL
SAFETY
COUNCIL**



**OCCUPATIONAL
SAFETY
SERVICES**



OCCUPATIONAL SAFETY SERVICES

This catalog is divided into sections for easy reference:

- 1 **ADMINISTRATIVE MATERIALS**—pages N-3 to 12
Technical publications, news-type periodicals, materials and services for safety program administration.
- 2 **SUPERVISOR TRAINING**—pages N-13 to 17
Films and other aids for developing foremen and supervisors.
- 3 **EMPLOYEE TRAINING**—pages N-18 to 33
Job training and attitude moulding materials, individually tailored to serve specific job interests and problems of each group of employees.
- 4 **MOTOR TRANSPORTATION**—pages N-34 to 36
A complete service for professional drivers including training booklets, awards to act as interest arousers, and technical information for supervisors.
- 5 **ALPHABETICAL INDEX & PRICES**—pages N-37 to 38
Catalogs of Council publications in other fields of safety will be sent on request: Service Guide 2.3—School Safety Services, Service Guide 2.4—Traffic Safety Services, Service Guide 2.5—Farm Safety Services, Service Guide 2.6—Home Safety Services.

ACKNOWLEDGEMENTS*

The National Safety Council officers and committee members who are guiding the industrial publications program during 1951-52 are:

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* Acknowledgements of the work of Sectional and special committees are contained in the publications which they helped to prepare.



NATIONAL SAFETY NEWS

This monthly magazine is the best, single source of up-to-date information on safety engineering and program developments. Each 100 to 200 page issue includes: stimulating, informative articles written by experts in the field; factual data on accident hazards and problems; industrial hygiene and health information; news about people, products, and events; special features such as a monthly opinion poll on controversial safety issues.

By keeping key executives advised as to what others are doing about safety, NATIONAL SAFETY NEWS paves the way for engineering and program improvements in your own organization. Give a subscription to each person who has a voice in determining your safety activities.



ACCIDENT FACTS

The annual roundup of accident figures and facts. Complete statistical summary of the national accident experience, with explanatory tables, charts, and illustrations. Shows average frequency and severity rates, general trend of accidents, no-injury records, etc. Normally issued in July, containing figures for previous year. About 100 pages, size 8" x 9".

NEWS LETTERS

Monthly publications dealing with accident prevention within given installations. 4 to 6 mimeographed 8 1/2" x 10 1/2" pages. News letters are published for the following Sections:

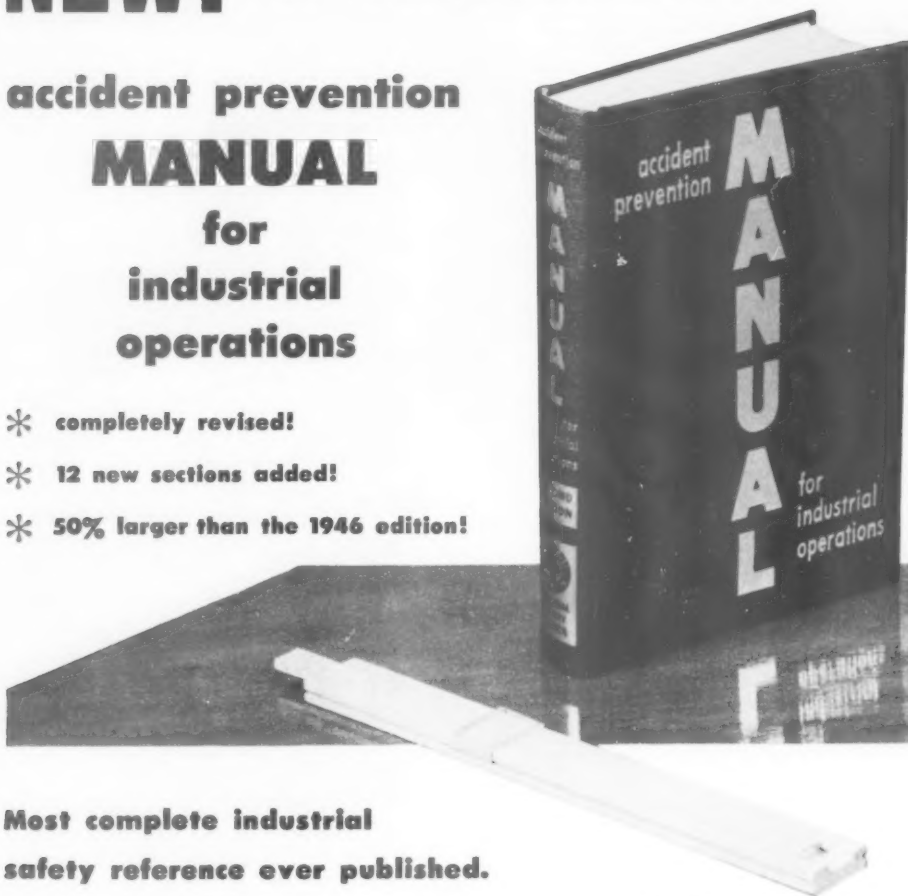
- Aeronautical Industries
- Air Transport
- Automotive and Machine Shop
- Cement and Quarry
- Chemical
- Coal Mining
- Commercial Vehicle
- Construction
- Electrical Equipment
- Food
- Glass and Ceramics
- Hospital Safety Service
- Industrial Nursing
- Marine
- Meat Packing, Tanning and Leather Products
- Metals
- Mining (other than coal)
- Petroleum
- Power Press and Forging
- Printing and Publishing
- Public Employee
- Public Utilities
- Pulp and Paper
- Railroad
- Rubber
- Textile
- Transit
- Wood Products

SEE PAGES 37 AND 38 FOR PRICES

NEW! 812-PAGE 2nd Edition

accident prevention MANUAL for industrial operations

- * **completely revised!**
- * **12 new sections added!**
- * **50% larger than the 1946 edition!**



Most complete industrial safety reference ever published.

This completely-revised edition is a must for anyone with substantial safety responsibility. Its 812 pages include 12 new sections (26 in all)—with greater detail and more complete treatment. Written by the entire industrial staff of the National Safety Council in conjunction with its industrial members. It puts the results of 38 years safety experience at your fingertips—with specific data about every common type of accident and health hazard. Handy cross-index at back of book quickly locates cause-and-cure information on everything from industrial poisons to safe methods of handling materials.

SECTION REPRINTS

Each major section of the new Accident Prevention Manual for Industrial Operations is available as a separate reprint of approximately 32 pages, plus separate stiff cover. These 26 Section Reprints are intended for larger distribution of specialized material and replace many of the old Safe Practices Pamphlets which have been discontinued.

Titles of Section Reprints are:

1. Permanent Structure and Plant Layout
2. Maintenance and Maintenance Crews
3. Boilers
4. Pressure Vessels
5. Refrigerating Equipment
6. Principles of Guarding and Transmission Guards
7. Power Presses
8. Metalworking Machinery and Abrasive Wheels
9. Woodworking Machinery
10. Guarding Special Equipment
11. Storage and Manual Handling of Material
12. Power Handling of Material
13. Hand and Portable Power Tools
14. Welding and Cutting
15. Electrical Hazards
16. Flammable Liquids
17. Fire Prevention
18. Fire Extinguishment and Control
19. Personal Protective Equipment
20. Motor Transportation
21. Industrial Health Engineering
22. Industrial Poisons
23. Medical Services and Table of Chemical Hazards
24. Safety Organization and Training
25. Accident Records
26. The Safety Man's Resources

SAFE PRACTICES PAMPHLETS

These are detailed studies of important accident and health problems, prepared by the Council in collaboration with experts in the particular branches of industrial safety and health.

The Safe Practices Pamphlets comprising the revised general set have been selected for their continued use as supplements to the second edition of the Accident Prevention Manual for Industrial Operations. Certain of

these pamphlets contain greater detail than the sections covering similar material in the Manual. Others deal with subjects not covered in the Manual. A third group consists of pamphlets which are more limited in scope than the Manual and thus they offer a more compact package of information. A complete listing of the pamphlets currently stocked is given below. Pamphlets formerly published, but not shown below, were considered obsolete upon publication of the new manual, and have been killed.

GENERAL PAMPHLETS

All general pamphlets may be obtained as a set in a 1-1/2" 3-ring binder at reduced rates.

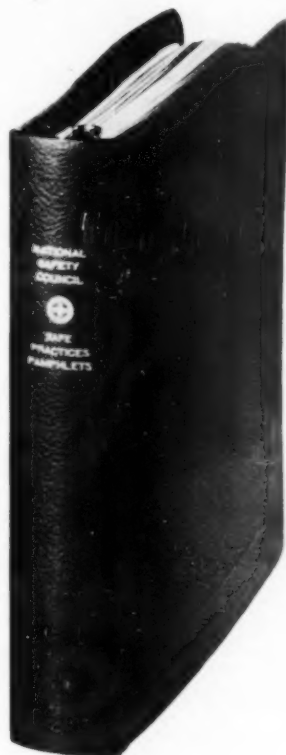
Accident Records and Analysis	21
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Static Electricity	52
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Waste Disposals, Industrial, and Bibliography on Chemical Wastes	Chem.7
Women in Industry	107

SPECIAL INDUSTRIES PAMPHLETS

These may be ordered as individual pamphlets, or as a complete set in a 1" 3-ring binder.

Box Manufacturing, Paper	PP-2
Cement Burning	CEM-3
Cement Mill Grinding, Raw and Finished	CEM-2
Cement Mill Shops	CEM-4
Cement Mill Yards and Railroads	CEM-6
Cement Rock Quarrying and Crushing	CEM-1
Cement, Storing, Packing and Shipping	CEM-5
Chemical Burns	CHEM-3
Construction Building	CON-1
Cotton Mills	T-1
Cyanide Compounds	CHEM-6
Demolition of Structures	CON-5
Distilleries—Grain Handling and Milling	F-6
Distilleries—Mashing, Fermenting, Distilling and Stillage Drying	F-7
Distilleries—Warehousing and Bottling	F-8
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Linemen's Rubber Protective Equipment	PU-3
Marine Boilers	MAR-2
Mercantile Establishments	CE-1
Nitric and Mixed Acids, Fume Poisoning from	CHEM-2
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Pile Driving	CON-4
Poles, Handling of	PU-4
Public Employees	MUN-1
Public Utility Employees, Protecting on Streets and Highways	PU-1
Pulpwood Logging	PP-3
Railroad Track Cars (Hand and Motor)	RR-1
Rubber Industry, Compounding Materials Used in the (Part 1)	RU-1
State Highway Employees	HY-1
Vulcanizers and Devulcanizers	RU-2



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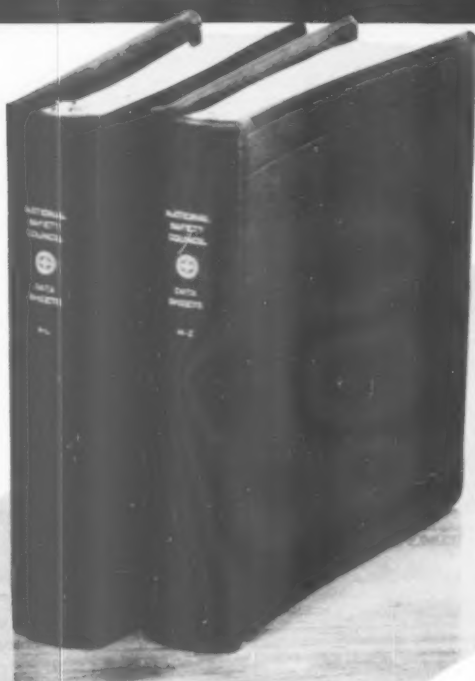
when you need the right answer **FAST!**

DATA SHEETS

come through!

Each Data Sheet gives you the most authoritative information possible on a specific subject—including the experience of many companies which have dealt with the subject and assisted in preparing the data. They are 8 1/2" x 11" in size; 1 to 8 pages in length. Fifteen to twenty new Data Sheets are prepared each year, most of them first appearing in NATIONAL SAFETY NEWS. Data Sheets are now available in two jumbo-size 3-ring loose-leaf binders—indexed for easy reference. They may be ordered in complete sets—or individually as listed below.

A set of DATA SHEETS in your reference collection can be worth its weight in gold when you need the right answer . . . fast.



LIST OF DATA SHEETS

Acetic Acid	D-Chem. 29
Acetone	D-Chem. 23
Acid, Removing from Carboys (rev. 11-39)	D-Chem. 9
Air Compressors and Receivers, Cleaning	D-Me. 14
Airplanes, Electrical Grounding of	D-A. 1
Air Terminal Vehicular Traffic Safety Guide	D-A. 3
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ACCIDENT RATES PAMPHLETS

These pamphlets review the accident experience of about 200 industries and about 30 general groups. The pamphlet for your industry will enable you to compare your company's accident frequency and severity rates with those of other companies doing similar work. Size $5\frac{1}{2}'' \times 8\frac{1}{2}''$.

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CONSTRUCTION JOB MANUAL

A manual designed for job superintendents that combines plans for safety and efficiency under one cover. The manual includes Safe Practices Pamphlets on construction subjects, Construction Detail Sheets, Industrial Data Sheets, miscellaneous job forms, text, and plans, in leather binder. Page size $8\frac{1}{2}'' \times 11''$.

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Sponsored by American Institute of Architects and National Safety Council, and approved by the American Standards Association. 86 pages: $7\frac{3}{4}'' \times 10\frac{3}{8}''$.

HOSPITAL SAFETY SERVICE

A monthly packet of hospital safety materials, including posters, instructional materials for personnel training and information for administrators.

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The Council publishes a number of items designed for hotels, restaurants, and similar service industries. Write for information.

ACCIDENT ANALYSIS CHART

For use by small plants, hotels and other service industries to record frequency rates

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and general accident history of the organization. Size $8\frac{1}{2}'' \times 11''$. 2 sides; in pads of 50.

SAFETY INSPECTION CHECK LIST

A check list of safe and unsafe conditions. Reverse side blank for making detailed comments or recommendations. Size $8\frac{1}{2}'' \times 11''$. In pads of 50.

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IS-3—Industrial Employee Injury Record ($4'' \times 6''$ 1 side card).
IS-4—Industrial Injury Summary ($8\frac{1}{2}'' \times 11''$ 2 sides).
IS-5A—Monthly Summary of Industrial Injuries ($8\frac{1}{2}'' \times 4''$ 1 side).
IS-6—A First Aid Report Form. In pads of 100. (Size $4'' \times 6''$).
IS-7—Department Supervisor's Accident Cost Report ($8\frac{1}{2}'' \times 11''$ 1 side).
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FASTER, CHEAPER, SAFER!

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A monthly packet of hospital safety materials, including posters, instructional materials for personnel training and information for administrators.

SAFETYMAN'S LIBRARY

Here is a safety library of the Council's most frequently needed reference publications. It includes: the 812 page Accident Prevention Manual; a complete set of the General Safe Practices Pamphlets in a binder; a set of Industrial Data Sheets in 2 binders; a set of Detail Sheets in a binder; and a set of Safety Instruction Cards in a file case. This Safetyman's Library may be had for 10% less than the total cost of the items included.



SEE PAGES 37 AND 38 FOR PRICES

Keep your management group "on their toes" . . .
safety also with **ADMINISTRATIVE UNITS**



**Supply essential safety information
to the right people . . . in balanced quantity
on the right subjects . . . all the year around**



MEDICAL
DIRECTORS



SAFETY
ENGINEERS



TRANSPORTATION
SUPERVISORS



MAINTENANCE
FOREMEN



TRAINING
SUPERVISORS

WHAT THEY ARE An Administrative Unit is a cream-of-the-crop combination of monthly, annual, and special Council materials selected to provide a balanced information service for the key men in your safety program. Each Unit includes copies of know-how publications, such as a safety manual, and subscriptions to news-type publications, such as the NATIONAL SAFETY NEWS and News Letter. When ordered as a Unit, these publications cost at least 10% less than they would if purchased individually.

HOW THEY WORK The Unit provides the subscriber with a background of safety information, and keeps him up to date with safety engineering and program developments. The Unit permits participation in Council Sectional activities. The Unit keeps subscribers informed about new Council services and materials. Unit

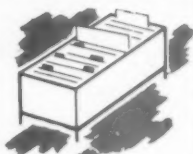
holders receive all Council Service Guides, announcements, and literature describing new safety aids, as well as samples of many of the new publications.

WHO NEEDS THEM "A" Units are for full-time safety supervisors. "B" Units are for people with substantial safety responsibility: personnel directors, industrial training supervisors, plant engineers, insurance engineers and inspectors, part-time safety supervisors of installations with 100 to 400 employees. "C" Units are for people with incidental safety responsibility: medical directors, chiefs of plant protection, maintenance foremen, part-time safety supervisors of installations with less than 100 employees. In addition to the eight Units described below, there are many other Units for people interested in various fields of safety. Information on these Units will be sent on request.

When ordering Units, be sure to specify: name and title of the individual, company name, street address, city, zone, and state, type of Unit desired, choice of sections. You'll find a list of Council sections under "News Letters" on page N-3.

TYPE OF ADMINISTRATIVE UNITS	General	Industrial			Transportation			Con- struction
	AA-1	A-1	B-1	C-1	A-2	B-2	C-2	B-11
Services Included:								
1. National Safety News, monthly	1	1	1	1	1	—	—	1
2. Public Safety Magazine, monthly	1	—	—	—	1	1	1	—
3. Sectional Enrollment and monthly News Letter	3	3	2	1	3	2	1	1
4. Industrial Supervisor, monthly	1	1	—	—	—	—	—	1
5. Accident Rates pamphlet, annually	2	1	1	—	1	1	—	1
6. Manuals, as issued								
a. Accident Prevention Manual	1	1	1	—	—	—	—	—
b. Industrial Safety Guide	—	—	—	1	—	—	—	—
c. Fleet Manual, large	1	—	—	—	1	1	—	—
d. Fleet Manual, small	—	—	—	—	—	—	1	—
e. Construction Job Manual	—	—	—	—	—	—	—	1
7. Congress Transactions, annually								
General	1	1	1	1	1	1	1	1
Subject Sessions	1	1	1	1	1	—	—	1
Section Meetings	3	3	2	1	3	2	1	1
8. National Safety Calendar, annually	1	1	1	1	1	1	1	1
9. Accident Facts, annually	1	1	1	—	1	1	—	1
10. Technical releases for your industry, as issued	1	1	1	1	1	1	1	1

SAFETY SERVICES



At least five times yearly, the Council conducts a course in the fundamentals of industrial safety. There are certain things every safety man must know in order to prevent accidents. He must know how to organize a safety program, what records to keep and how to use them, how to make the plant safe, etc. These are some of the fundamentals taught in the Basic Course of the Safety Training Institute. (Write the Council's Training Director for schedule.)

Obviously, no one can learn in one week all there is to know about running a safety program. The main purpose of the course is to provide a solid foundation of safety knowledge. Then, to supplement the infor-

mation presented in the course, each person is given a kit of reference materials that may be used for follow-up study.

There are no educational requirements, no experience requirements. Anyone who works for a Council member may take the course. The tuition includes the cost of the reference materials given to each participant.

ALSO AN ADVANCED COURSE

It is open to persons who have completed the Basic Course and includes: technical writing, public speaking, psychology in safety, visual aids, etc. Write the Council's Training Director for further details.

SAFETY TRAINING INSTITUTE



CONSULTATION SERVICE

The Council's staff of engineers, safety technicians and industrial hygienists are at your command. They are equipped to give you unlimited assistance in planning and running a successful safety program.

LIBRARY SERVICE

The world's biggest collection of safety information—thousands of publications, articles, photographs, illustrations on every conceivable safety subject—is yours to use. Material on any subject will be mailed to you on request.

NATIONAL SAFETY CONGRESS

The biggest annual event in safety—a week of talks and discussions by the country's leading safety authorities—exhibits of safety equipment. It is held in Chicago during October. You can send any number of representatives to learn about the latest safety developments and to meet and exchange ideas with safety men in your industry.

EMPLOYEE PUBLICATIONS SERVICE

The Council will keep you supplied with safety publicity material for plant magazines, newspapers and bulletins. Mats and proofs of safety cartoons, a clip sheet and a monthly Newsletter containing safety news items of general interest are yours for the asking.

PERSONNEL BUREAU

The Council maintains a confidential file of safety men who are interested in changing jobs. If you need a safety director or en-

gineer, the Council can help you find the right man for the job.

SECTIONAL ACTIVITIES

Part of the income from Council Dues and publications covers the costs involved in developing safety codes and safe operating procedures for your industry and other technical studies, and in running intra-industry contests. These sections sponsor yearly contests: Aeronautical Industries, Chemical, Commercial Vehicle, Foods, Glass, Marine, Meat Packing, Metal, Pulp and Paper, Petroleum, Printing & Publishing, Public Utilities, Rubber, Tanning & Leather, Textile, Transit, and Wood Products. Any Council member or Federal installation may compete. The only requirement is a simple monthly report. Entrants compete only with organizations of their own size which have similar operations. Each month you receive a report of your standing. If you win, there's a handsome trophy that's yours to keep. The Council will send you contest posters, report forms, and the contest rules upon request.

STATISTICAL SERVICE

The information maintained on accident frequency and severity in 200 industries permits you to check your standing and the progress of your program against the records of other organizations doing similar work. Charts and tables are prepared on unsafe acts, agencies of injury and unsafe conditions that lead to accidents.

SPEAKERS BUREAU

A file of both volunteer and professional speakers is maintained to place you in contact with persons qualified to give safety talks to various types of audiences.

SEE PAGES 37 AND 38 FOR PRICES

TRAINING SUPERVISORS

the KEY MEN in your safety program

The materials shown on the next five pages are among the most widely used by American industry to upgrade the performance of foremen and other supervisory personnel:



- * 3 film training courses
- * 2 pamphlet training courses
- * 162 five minute safety talks
- * an interest-maintaining monthly magazine

(1) They teach your foremen the fundamentals of accident prevention as it relates to their jobs.

(2) They build interest in your program by showing your foremen how safety boosts production and improves morale.

(3) They give your foremen a basic understanding of human relations and show how to use this knowledge on the job.

Industrial SUPERVISOR

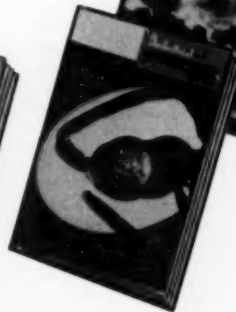
the safety magazine for foremen



It keeps your foremen sold on safety. This is the training aid that consistently drives home the fact that safety and production go hand in hand—that both are the job of the foreman.

The 16-page monthly issues include articles on phases of accident prevention of particular interest to foremen; "how-to-do-it" information, contests, photo stories, thought-provoking philosophy by the popular "Arm Chair Expert".

INDUSTRIAL SUPERVISOR takes over where other training aids leave off. It keeps alive your foremen's interest in safety . . . assures their help in making your safety program a success. Yet it costs so little that many safety men call it the biggest bargain in safety. Be sure each of your foremen gets his own copy each month.



SAFETY MANAGEMENT FOR FOREMEN

a complete safety training film course

Safety Management for Foremen consists of ten 35 mm sound slidefilms with Leader's Manual—everything needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities such as machine guarding, safety inspections, the first aid program. This series was originally produced in cooperation with the U.S. Department of Labor to help conserve manpower for warpower. More than 2,000 sets of the original and present revised editions have been circulated in industry. The set is packed in a sturdy leatherette carrying case. Running time of each film is 20 minutes. Sets for purchase, Item #141.00. Rental or preview of sets or individual films, Item #149.01.



FOLLOW THE LEADER gives a step-by-step description of how to organize a safety program. Ten components of a good program are discussed. (Class II Film) Item #141.05

CAUSE AND CURE shows how to analyze an accident to determine its basic causes. Ten unsafe acts and eight unsafe conditions are illustrated. (Class II Film) Item #141.02

GUARD DUTY pictures effective guards for common power machines, and points out that it's up to foremen to see that these guards are kept in place. (Class II Film) Item #141.04

SAFETY IS IN ORDER is all about good housekeeping, from the foreman's angle. It shows how good order saves space, time, and material. (Class II Film) Item #141.09

RIGHT DRESS pictures common types of personal protective equipment, and explains on what jobs each type should be used. (Class II Film) Item #141.08

DOCTOR'S ORDERS discusses the importance of regular physical examinations, prompt first aid treatment, and reports on all first aid cases. (Class II Film) Item #141.03

BRAIN BEATS BRAWN teaches foremen the best material handling practices, so that they in turn will know what to teach their workers. (Class II Film) Item #141.01

STOP, LOOK AND LISTEN pictures a safety inspection committee at work—shows what to look for when making a plant inspection. (Class II Film) Item #141.10

PRINCIPLES AND INTEREST demonstrates that selling safety is like selling anything else. Only when workers are interested can you prevent accidents. (Class II Film) Item #141.06

PRODUCTION WITH SAFETY proves conclusively that it takes less time to prevent accidents than to have them—that safety increases production. (Class II Film) Item #141.07

ABOUT COUNCIL FILMS

Council sound slidefilms consist of a 35mm filmstrip and a 33 1/3 RPM recording. All film sets and most individual films have a conference leader's manual (discussion outline and quiz). One copy is furnished with each film purchased.

Filmstrip or record replacements for sound slidefilms may be purchased at 1/4 the price listed for the complete film, provided the damaged part is returned with the order. Otherwise, cost of either replacement is 1/2 the price listed for the complete film.

+ Sound slidefilms marked with this symbol are produced in a new form known as the 30-50 low frequency signal. One side of the sound slide film recording uses an inaudible signal for automatically advancing each picture in synchronization with the narration on the recording. The other side of the record has the audible signal for advancing the film manually. Special projectors are needed to operate films on the inaudible signal side. In the future, all new films will be produced in this double form.

SEE PAGES 37 AND 38 FOR PRICES

N-14

PREVIEWS—Films will be sent on approval. Preview service charge is applied against the purchase price if the film is retained.

SPEAKING OF SAFETY

shows foremen how to speak up for safety

A new set of films that can do a much-needed job for you. They will teach your foremen and supervisors the tips they should know about putting ideas into words that will be remembered!

This set of films was prepared by Dr. Irving J. Lee, Professor of Public Speaking, School of Speech, Northwestern University. It consists of six 35 mm sound slidefilms and leader's manual in an attractive leatherette case. The 16-inch records are pressed for automatic advancement on one side, and for manual advancement on the other side. Running time of each film, 13 minutes. Sets for purchase, Item #143.00. Rental or preview of sets or individual films, #149.03.

THE POWER OF SPEECH is an introduction to the film set. It lists occasions when foremen might be called upon to make a speech, explains the differences between formal and working speeches and the purpose of a speech. [Class I Film] Item #143.05

BUTTERFLIES IN YOUR STOMACH explains the physiological reactions that cause stage fright and shows how you can use it to your advantage. [Class I Film] Item #143.01

THE KEY TO GOOD SPEAKING outlines four methods of preparing for a talk and gives step-by-step description of the best way to prepare a "working" safety talk. [Class I Film] Item #143.02



ON YOUR FEET explains how to stand when you get up to talk; the purpose of moving, and how to do it effectively; where to look and what to do with your hands. [Class I Film] Item #143.04

NOW YOU'RE TALKING discusses the actual speech making: how to talk—vocabulary, phrasing of ideas, attitude; how friendliness, sincerity and enthusiasm can make your speech a success. [Class I Film] Item #143.03

RING THE BELL shows how to "break the ice" and hold the audience's attention; the value of demonstrations, films, pictures, charts and graphs; how to illustrate a point with a personal experience, comparisons or a humorous story. [Class I Film] Item #143.06



HUMAN FACTORS IN SAFETY

shows foremen how to handle people

This important film series will make your foremen **BETTER** safety supervisors . . . **BETTER** production men . . . **BETTER** liked by their workers.

Human Factors in Safety is a set of six 35 mm sound slidefilms with Leader's Manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train new workers, how to keep experienced workers on their toes, and how to win respect, cooperation and loyal support.

Complete set includes an attractive tan leatherette carrying case. Running time of each film is 15 minutes except Safety Case Histories which is 30 minutes. Sets for purchase, Item #142.00. Rental or preview of sets or individual films, Item #149.02.

THE SECRET OF SUPERVISION sets the stage for other films in the series. In story form, it shows why people will work hard for some supervisors, yet rebel against others. [Class I Film] Item #142.04

TEACHING SAFETY ON THE JOB shows supervisors how to prepare and give job safety instructions. The four steps of good job training illustrated are: 1. Preparation; 2. Presentation; 3. Application; 4. Testing. [Class I Film] Item #142.05

PEOPLE ARE ALL ALIKE explains that all normal people have certain basic, human wants. The film shows how supervisors can satisfy these wants—and by so doing, get their men to work WITH them. [Class I Film] Item #142.01

EVERYBODY'S DIFFERENT shows supervisors how to make allowances for individual differences—how to handle the tough guy, the show-off, the loud-mouth, the day-dreamer, and the practical joker. [Class I Film] Item #142.02

TEAMWORK FOR SAFETY suggests ways for supervisors to make safety interesting. Holding meetings, encouraging worker suggestions, using safety literature . . . are some of the techniques discussed. [Class I Film] Item #142.06

SAFETY CASE HISTORIES is a study of actual accidents that were caused by "human factors." After each case is presented, the film is stopped so the audience can discuss the accident causes, and remedies. [Class III Film] Item #142.03

a new study-discussion course—



PSYCHOLOGY OF SAFETY IN SUPERVISION

This tremendously popular set of booklets was written by Dr. J. L. Rosenstein, noted industrial psychologist, author and lecturer.

All six booklets have a strong safety slant, but more than preventing accidents, they help supervisors develop a good understanding of worker attitude and actions, enabling them to do a better job of controlling their people. The booklets are 6" x 9", printed in two colors. A conference leader's guide is included with each order. These are the six booklets in the series:

YOU CAN'T CHANGE HUMAN NATURE, discusses common peculiarities of human nature, explains why and in what way (1) No one is perfect; (2) People don't look ahead; (3) People resent change; (4) People are led by faith; (5) Human nature is near-sighted; (6) People want to know what's going on; (7) People want something to live up to; (8) People are defensive.

WHAT IS YOUR UQ?, explains the meaning and importance of a supervisor's "understanding quotient"—his ability to understand the attitudes and actions of his workers. The booklet outlines four methods by which a supervisor can develop his UQ.

TEACHING SAFETY ON THE JOB, describes a series of accidents that happened because workers lacked sufficient knowledge or skill. The booklet then discusses the supervisory training methods required to prevent such accidents.

PEOPLE ACT ALIKE, explains in what way normal people are all alike, and in what manner they differ from one another. It discusses basic human wants . . . explains how supervisors can satisfy these wants . . . and points out what allowances should be made for differences in personalities, abilities, and emotions.

SAFETY TAKES TEAMWORK, suggests ways for supervisors to make safety interesting and important to their workers. Holding stimulating safety meetings, encouraging suggestions from workers, using safety literature to good advantage, getting workers to inspect for hazards . . . are some of the techniques discussed.

YOU ARE HUMAN TOO, gives supervisors a "measuring stick" for determining their own strong points and weaknesses. It shows them how to evaluate their habits, their emotional biases, their abilities as supervisors . . . and concludes with a summary of the main points covered in the series.

a basic-safety booklet course



SAFETY IN FOREMANSHIP

A set of pamphlets, each devoted to an outstanding phase of the accident problem, and treated wholly from the foreman's viewpoint. These pamphlets provide a ready-made course for teaching the principles of accident prevention to foremen. An instructor's outline suggesting ways to present the material is provided with each order.

A SERIES OF 12 BOOKLETS

Each is 6" x 9" in size with from four to eight inside pages of swift-moving, narrative-style safety discussion. Booklet No. 1 is an introduction to the booklets to follow. The others are:

1. "The Foreman's Opportunity—Production With Safety" (foremen's responsibility for the safety of workers)
2. "Have You Thought About This?" (the human suffering caused by accidents)
3. "Do You Know How Much An Accident Costs?"
4. "Safeguards—Why and How"
5. "Look Out For That First Step!" (safety instruction for the new worker)
6. "Are You Following Through?" (enforcement of safety instructions)
7. "What Accident Statistics Tell The Foreman"
8. "Why And How To Be A Good Housekeeper"
9. "Detecting And Correcting Unsafe Conditions"
10. "After An Accident—What?"
11. "What About Fire In Your Department?"
- 12.

here's the "down to brass tacks" help

Your foremen want and need **READY-MADE 5-MINUTE SAFETY TALKS**

FIVE MINUTE SAFETY TALKS FOR FOREMEN—BOOK NO. 1

A book that contains 52 informal five-minute safety talks for your foremen. Each talk is written by a safety man with years of experience in his field. Covering all phases of industrial accident prevention from, why there is a safety program to step-by-step explanations of specific hazards and equipment, it contains material for conducting departmental safety meetings every week of the year. 112 pages, size 8½" x 11".

FIVE MINUTE SAFETY TALKS FOR FOREMEN—BOOK NO. 2

A brand new series of 52 talks produced in response to popular demand as the perfect sequel to Book No. 1. Written with fresh, new, different viewpoints—provides continuity in following-up after Book No. 1.

SAFETY TALKS FOR CONSTRUCTION AND MAINTENANCE FOREMEN

58 safety talks for foremen, packed into a 128 page booklet. These hard-hitting talks cover everything from why accident prevention to blasting operations. Written in the language of the foremen. A page of instructions tells your foremen how to use the talks—not as speeches to be read, but as sources of information. Gets down to details on how to conduct "tool box" meetings that pack a punch like a bulldozer. Written by members of the Executive Committee, Construction Section, National Safety Council. Size 8½" x 11".



Brief-Case Size For On-The-Job Use In The Construction Industry

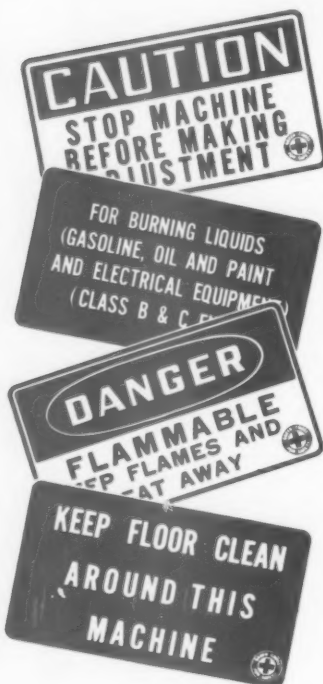
"Illustrated Safety Talks" are 11" by 14" and mounted in easel-type binders. One side of each page shows drawings or photos for the group to view—the reverse side has remarks for the leader to use. While primarily designed for use in the construction, and cement and quarry industries, they also have broad application throughout the Petroleum, Mining, Public Utility, and many other fields. Three different "Illustrated Safety Talks" are now available:

1. Why Accident Prevention In The Construction Industry?
2. Shovels, Cranes and Draglines.
3. Personal Protective Equipment.

SEE PAGES 37 AND 38 FOR PRICES

DECALCOMANIAS

Safety decals attached to machine frames, guards, fuse boxes, and fire doors constantly remind workers to observe safe practices; follow specific instructions. These full color decals conform to ASA specifications. Order by letter and number. Available only in size 2" x 3 1/2".



SAFETY DECALS* (white letters on green ground)

- S-1—Sound Warning at Corners and Aisle Crossings
- S-3—Do Not Talk To or Distract Operator
- S-4—Before Starting Be Sure Everyone Is in the Clear
- S-5—No Riders
- S-6—Keep Tools in Safe Condition and in Proper Place After Use
- S-7—Keep Floor Clean Around This Machine
- S-8—First Aid Kit
- S-9—Only Authorized Persons May Change Fuses or Make Repairs
- S-10—Keep This Space Clear
- S-13—Avoid Falls, Walk—Do Not Run—Use the Handrail
- S-14—Please Keep Your Locker Clean



CAUTION DECALS (black letters on yellow ground)

- C-1—Shut Off Machine When Not in Use
- C-2—Fire Door—Do Not Block
- C-3—Shut Off Engine Before Refueling
- C-4—To Be Operated Only by Authorized Employees
- C-5—Pull and Lock Switch Before Oiling, Adjusting or Repairing Machine
- C-6—Use Brush to Remove Chips
- C-7—Stop Machine Before Making Adjustments
- C-8—Use Fuse Puller to Remove Fuses
- C-9—Do Not Operate Without Guards
- C-10—Keep Guards in Correct Adjustment
- C-13—Ground Equipment Before Use
- C-14—Do Not Use Near Electrical Equipment
- C-17—Do Not Open While Machine Is in Motion



DANGER DECALS (black letters on white ground; white "Danger" on red ground)

- D-1—Do Not Wear Gloves While Operating This Machine
- D-2—High Voltage
- D-4—Keep This Guard in Place
- D-6—Wear Goggles While Operating This Machine
- D-7—Flammable—Keep Flames and Heat Away
- D-8—Corrosive Liquids—Use Personal Protective Equipment
- D-9—220 Volts
- D-10—440 Volts
- D-12—No Smoking
- D-13—Wear Goggles in This Area
- D-14—Oxygen—Keep Oil and Grease Away
- D-15—Acid
- D-16—Caustic
- D-17—Replace Guard Before Using Machine



FIRE DECALS (white letters on red ground)

- F-1—For Wood, Paper, Textiles and Rubbish (Class A Fires) Not Electrical Equipment
- F-2—For Wood, Paper, Rubbish and Burning Liquids (Class A & B Fires) Not Electrical Equipment
- F-3—For Burning Liquids (Gasoline, Oil and Paint and Electrical Equipment) (Class B & C Fires)
- F-4—Sprinkler Valve—Do Not Close Unless Authorized

SPRINKLER VALVE
DO NOT CLOSE UNLESS
AUTHORIZED



A Green Cross for Safety emblem printed in white letters on green ground, with the words "MEMBER NATIONAL SAFETY COUNCIL" underneath in green. For use on office doors or windows. Emblem is 3 1/2" in diameter.

SEE PAGES 37 AND 38 FOR PRICES

rh THE *Safe* WORKER



JOB TRAINING BOOKLETS



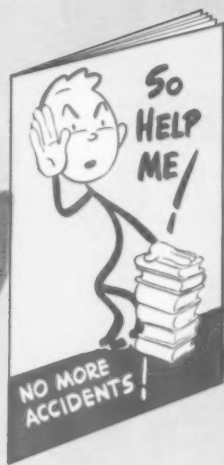
STEPS to SAFETY

A personal checklist of sound safety rules that apply to any worker on any job—and off-the-job, as well. The straight-from-the-shoulder approach portrays the safety program as the personal concern of each employee. Cartoons on all its 16 pages. 3" x 5½".



HEAVE-HO!

One of the most complete and effective lifting stories you can give your workers. It takes them through material handling from start to finish, from sizing up the job to actual lifting techniques. Cartoon illustrated, 12 pages, 3" x 5½".



SO HELP ME!

A sprightly safety rule booklet jam-packed with no-accident tips, eye catching safety cartoons and lifting safety jingles. An inspirational memory refresher highlighting the tried and true safety precautions. 20 pages—3" x 5¼".



AREN'T PEOPLE FUNNY?

Illustrates a number of common human foibles and faults that can lead to accidents. It shows in humorous fashion the relationships between attitudes and unsafe behavior, spotlighting various unsafe characters. 16 pages—3" x 5½".

OFF-THE-JOB BOOKLETS



CRY WHOA!

Plucks Will Shakespeare out of the past and puts him behind the wheel, face-to-face with today's driving problems. His pointed comments will help to reduce off-the-job motor vehicle accidents among your workers. 16 pages—3" x 5½".

HOLD EVERYTHING!

Deals with accidents in the home, on the street, at play, on summer vacations. Includes an interesting self-test for checking hazards in the worker's home, and a "What's Wrong With This Picture?" traffic quiz. 16 pages—4" x 7".

HAPPY VACATION

A colorful illustrated booklet filled with hints and tips showing how to have a safe and pleasant vacation by side-stepping accident hazards. A handy chart is included to record the vacation budget. 8 pages—3½" x 8".



SAFETY 'ROUND THE CLOCK

Extends interest in safety to the home and to the worker's family. It gives hour by hour hints on home safety, from the time to rise until the cat is put out for the night. Cartoon illustrated. 8 pages—3½" x 8".





STILL WAGGIN'

Encourages workers to get prompt first aid no matter how minor the scratch or injury. It is a new approach on the value of first aid, with amusing cartoons and short factual pointers. 16 pages—3" x 5½".



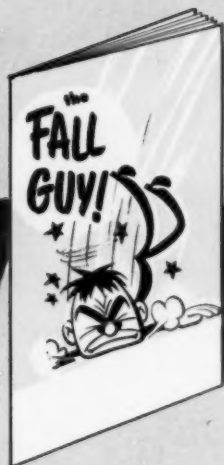
A WISE BIRD FOLLOWS THE RULES

Answers a basic need in safety programs — showing workers why rules exist, who makes them, and how they are formulated. Clever cartoons and copy give workers a better slant on the safety program. 16 pages—3" x 5½".



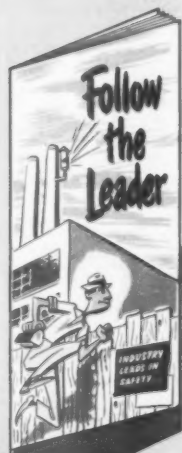
K. O. DIRT AND DISORDER

Sells workers on plant house-keeping. Colorful cartoons and light-touch writing drive home important points in keeping the plant clean, neat and orderly . . . free from accident and fire hazards. 16 pages—3" x 5½".



THE FALL GUY

Stresses the hazards that cause falls in industry: poor house-keeping, failure to use hand-rails, unsafe ladder practices, undue haste, hitching rides, lack of attention, makeshiftes and faulty equipment. 16 pages—3" x 5½".



FOLLOW THE LEADER

Re-teaches the cardinal points of job safety, shows the worker how these same points can protect him while off the job, and impresses him with the great job industry does in keeping him safe while at work. 8 pages—3¼" x 8"

HAVE FUN!

A vacation send-off booklet chock full of safety tips, from motoring and swimming to hiking, hunting and camping. Humorous cartoons show workers how to have more fun while avoiding vacation hazards. 8 pages—3¾" x 8"



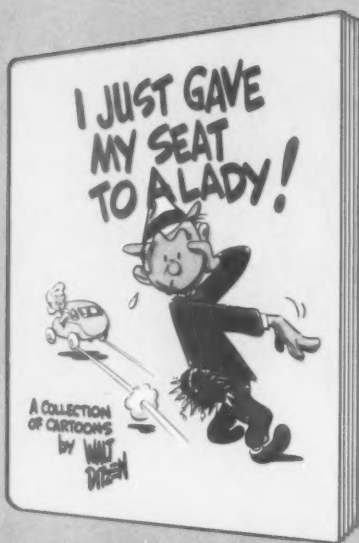
THE DRIVER'S LUCKY SEVEN

Shows that driving a car needn't be a gamble. You can make your own luck by: keeping the car safe; holding down speed; stopping, looking and listening; being in shape to drive; passing with care; and other steps. 8 pages—3½" x 8"



SAFE AT HOME

Gay, informative and packed with suggestions for eliminating accident hazards in the home. Room by room, it illustrates ideal arrangement from the safety angle. Illustrated with 2-color line drawings. 16 pages—4" x 7¼".



I JUST GAVE MY SEAT TO A LADY

A hilarious collection of safety cartoons by Walt Ditsen. 120 pages of humor that points up the light approach to safety training. A fine souvenir for safety dinners or plant rallies that your workers will enjoy for months to come. Size 4½" x 6½".



IN THE PINK

A Ditsen cartoon-illustrated booklet presenting the fundamental rules for good health, but with a fresh approach. Covers such subjects as: posture, sleep, eye and foot care, weight, cleanliness, and first aid. 16 pages, 3" x 5½".

WHIP YOUR WEIGHT IN WILDCATS

A smartly cartooned 8 page folder on ways to stay young enough to whip your weight in wildcats. The emphasis is on moderation, for those who want to keep in trim. 8 pages, 3½" x 8".



FIRST-AID REMINDERS

This set of eight 4-page leaflets is designed for quick reference in emergencies, and for effective first aid instruction. Size 3½" x 6¼", in attractive colors.

Titles are:

What To Do For a Wound—For Shock
What To Do For Bleeding
What To Do For A Broken Bone
What To Do For Heat Cramps, Heat Exhaustion, Sunstroke and Fainting

What To Do For Poisoning
Artificial Respiration
What To Do For Bruises, Sprains, and Strains—How To Move An Injured Person
What To Do For Burns and Scalds



SAFE 'N' SOUND

Set of 12 four-page leaflets for office worker . . . one for each month. Each illustrates and discusses common office accident hazards, as well as off-the-job safety. 3½" x 6¼".

PHOTOSCRIPTS

Photoscripts put safety across to your workers with realism. They're short, brief, to the point—they're convincing and easily understood. Actual photos drive home a story that sticks. Handy pocket size makes them ideal for payroll enclosures, handout literature, or mailings. Twelve Photoscript booklets are available as described below:



16 page, pocket-size booklets with dramatic, on-the-job photos.

A CLEAN PLANT

A clean plant is safer, more efficient, a better place to work. This photoscript points out that plant housekeeping is the responsibility of each worker.

PREVENT FIRE

Pictures common fire causes—how they can be spotted and eliminated. Stresses importance of knowing where emergency fire equipment is and how to use it.

GET FIRST AID

Stresses the importance of immediate first aid for ALL injuries. Tells workers that a minor scratch—untreated—can result in a crippling injury; never take a chance.

DRESS FOR SAFETY

Stresses clothing that fits you and your job, and the need for special protection on special jobs. Covers goggles, hard hats, safety shoes, gloves, etc.

LEARN SAFETY

Presents the ten basic rules for the prevention of personal injury. Discusses unnecessary chances, horseplay, handling material safely, first aid, safe clothing, good housekeeping, etc.

FALLS

Falls rank second only to automobile accidents as a cause of accidental death. This photoscript pictures ten safety rules for avoiding falls; eliminating fall hazards.

MACHINISTS HAND TOOLS

Presents four easily-followed rules for eliminating hand tool accidents; 1. The right tool; 2. In good condition; 3. Used correctly; 4. Kept in a safe place.

HANDLE WITH CARE

Presents practical tips on lifting, carrying and piling. Stresses importance of wearing gloves and protective foot gear when lifting.

MAINTENANCE TOOLS

Drives home the A B C's of handling tools. It shows how to prevent accidents by using them correctly, keeping them in good condition, and in the proper place.

PROTECT YOUR EYES

Illustrates the two good reasons for wearing safety glasses—both your eyes. Gives the prescription for eye safety; wear the right glasses, make sure they fit, and keep them clean.

FREIGHT HANDLING

Covers such standard procedures as how to lift; how to carry; how to pile materials; how to operate hand trucks; unloading hazards, and dock plates.

CONTROL OF FIRE

What to do when fires start. It explains the different classes of fires, pictures the various types of extinguishers, how to use them, and on which type of fire.

SEE PAGES 37 AND 38 FOR PRICES

to start safety committeemen off on the right foot

THE MAN WITH THE BADGE



The perfect indoctrination aid for safety committeemen. Because The Man with the Badge deals with the kinds of approaches to committee problems, rather than with the mechanics of safety committee operation, it is useful to all safety committeemen regardless of the job and responsibilities they hold.

Problems such as the relation of the safety committee to the safety department, the maintenance department, and top management are discussed. Practical suggestions on how to conduct safety inspections, committee meetings, and how to get along with supervisors are given.

Written in an informal and interesting style, printed in two colors and attractively illustrated, The Man with the Badge should be a valuable handbook for all participants in the plant safety program. 64 pages—4" x 6 1/2"

SAFETY INSTRUCTION CARDS

A valuable reference source for preparing job analyses, writing speeches, articles and planning plant or departmental safety meetings. Every supervisor should have a set of Safety Instruction Cards that pertain to his work available for reference purposes. It is a handy file of safety data, a rapid method of hazard detecting, a collection of complete concise safety check lists right at his fingertips.

Safety Instruction Cards are 3" x 5" vertical cards listing safe practices, accepted methods of performing specific operations and other information for workers and supervisors. They are inexpensive, time-saving aids. Use the cards for quick campaigns to correct unsafe practices; pass out for discussion at safety meetings. Many of the cards are suitable for distribution as pay-roll enclosures.

The complete set includes a two-way index (Service Guide 5.2) for locating the cards you want in a flash; a set of numerical dividers; and the file case. The metal case has a handsome gray finish, and is designed to hold the complete set of cards, with enough extra space to hold any future additions.

The Complete Set contains approximately 700 cards, and includes non-industrial, motor transportation and off-the-job safety subjects.

The Industrial Set contains approximately 480 cards of interest to all industry, plus the Special Industry cards that pertain to the purchaser's operations.

The Non-Industrial Set may also be ordered as a separate item.



**handiest file
of safety data
you've
ever seen!**

dramatize your safety program with the

GREEN CROSS FLAG

Flown at half-staff, this SAFETY FLAG is a mournful announcement of a lost-time accident. Run to the top on accident-free days, it's bright and cheerful symbol of life free from the tragedies of accidents. Awarded to the department with the best accident record for the month, it builds up a spirit of competition. Any way you choose to use it, this FLAG adds drama and color to your safety program.

The FLAG is made of heavy-duty white sheeting, with the Green Cross for Safety emblem centered on both sides in permanent waterproof color. It's six feet from flag end to pole, four feet from top to bottom, with hemmed edges, double stitched, all the way around. The hoist side has two metal grommets, with canvas reinforcement; the flag end is double-turned to prevent tearing by the wind. It's both sturdy and attractive. Flame-proofed on request.

S FLAG

This attractive nylon pennant may be purchased by winners of the Award of Honor. The Green Cross emblem and "S" are sewed on both faces of the flag. Size 4' x 8 1/2'.

SAFETY CONTEST TROPHY



An attractive award plaque to reward the best safety record in interdepartmental or interorganization contests. They will be proud to display this handsome 6" x 7 1/2" solid bronze casting on an 8" x 10 1/2" walnut plaque. Ample space for engraving inscription.

GREEN CROSS ELECTROS

An electrotype of the Green Cross emblem suitable for use on letter-heads, booklets, and in advertising. The Green Cross for Safety emblem may not be used directly or by implication to endorse or approve a

commercial product. Members may use the words: "Member National Safety Council," in conjunction with this copyrighted emblem. Mats and proofs of the emblem in 1/2", 1" and 2" sizes free.

NO ACCIDENT AWARD PINS



This handsome screw-post pin is the ideal recognition for workers who exert extra effort to work safely. Featuring the Green Cross in green enamel, each pin shows the exact number of accident-free years. 1 to 4 year pin: bronze; 5 to 9 year pin: silver plate; 10 to 40 year pin: gold plate. May be awarded according to your own rules, but may not be used as driver awards. In ordering, specify quantity of pins desired for each year. Pins are numbered 1 through 40 years.

GREEN CROSS PINS

Satin-finish silver-plated lapel pin featuring the Green Cross for Safety emblem in contrasting green enamel. Popular screw-post design.

SEE PAGES 37 AND 38 FOR PRICES

N-25

SAFETYGRAPHS

Safetygraphs are visual aids for training small groups. They are illustrated safety talks, ready for use at a moment's notice. They are complete within themselves, need no time-consuming preparation or costly equipment. A complete safetygraph consists of from 12 to 16 spiral-bound pages, inserted in a brown leatherette portfolio. Set the safetygraph on any flat surface, open the portfolio cover, and PRESTO—you have an easel. Your safety talk is printed on the back pages in large, easy-to-read type. And on the front pages, facing your audience, are colorful cartoons and duotone photographs that highlight your talk and drive home your statements. Use them in your own plant, to make your safety training job easier and more effective. You'll find that superintendents, foremen, training supervisors—even workers inexperienced in safety—can give a smooth, informative safety talk with a safetygraph as a helper.

At least one safetygraph easel is needed for each set of safetygraphs. The safetygraph and easel may be ordered as a set or as separate units.



#1. HOW TO LIFT

Teaches workers efficient and safe procedures for lifting, handling, and carrying materials. The rules stressed are: keep hands clear; get a good grip; have a good footing; bend your knees; keep the load close to you; get help for heavy or awkward loads.

#2. BENCH AND STAND GRINDERS

Discusses eye protection around grinders; spacing for work rests; work pressure; exploding wheels; over-heating; checking for damage; checking speed ratings when changing wheels; ring-testing for defects; hood adjustments; dressing wheels; excessive vibration.

#3. OPERATING A POWER PRESS

Emphasizes guarding—types of guards, and why the operator should use them. Also discussed are: use of sticks to remove pieces that are caught; special tools to insert and remove work; preventing damage to dies; proper dress; handling stock parts.

#4. WEARING GOGGLES

Is a head-long attack on complaint about wearing safety goggles. It shoots holes in time-worn excuses like: "they're too heavy" ... "this job'll only take a minute." With humor and logic, it wins over non-believers and reconverts backsliders who have been careless about wearing goggles.

#5. PLANT HOUSEKEEPING

Stresses it's up to workers to wipe up grease, put scrap in a box, keep the work place clear, and lockers clean. It discusses the safe way to stack materials: start foundations; keep piles straight; cross-tie layers; stepback of tall piles; keep aisles and fire exits clear.

#6. LADDER SAFETY

Teaches the four primary rules of ladder safety: 1. Select the right ladder; 2. Inspect it before use—look for weakness or faulty repairs; 3. Secure it—place at proper angle, use non-slip feet, or lash; 4. Use properly—climb the safe way, secure tools.

#7. USING FIRE EXTINGUISHERS

Explains the classes of fires, what type of extinguisher to use for each, and how to use it. It also discusses what to do in case of fire. The safetygraph is most effective when used in a two-part course, part 2 being outdoor demonstrations of extinguishers on actual fires.

#8. ACCIDENTS DON'T HAPPEN

Gets right down to the grass root of safety—to the basic principle that accidents don't happen, they are caused. It discusses unsafe conditions and unsafe acts, cites specific instance of each type, and shows how each accident could have been prevented.

#9. COMMON HAND TOOLS

Shows how to avoid hand and finger injuries caused by hammers, wrenches, chisels, knives, files, and screw drivers. The four ways to prevent hand tool accidents are: use the right tool; use a tool in good condition; use it the right way; keep in a safe place.

OUR SAFETY TRAINING PROGRAM...

#10. PREVENTING FIRE

Explains how it can be prevented by controlling two of the three fire components—heat and fuel. It discusses the major sources of heat in industrial fires; electricity; smoking; and the types of fuel involved in most industrial fires—greasy rags, flammable liquids, etc.

#11. TOE PROTECTION

Is a persuasive presentation of the facts about safety shoes. It examines all the common objections to wearing safety shoes, and proves that each is based on unfounded prejudice or lack of information. It also shows some off-the-job uses for safety shoes.

#12. ELECTRICAL HAZARDS

Sums up important points to remember about electricity and electrical equipment. 1. Use good equipment. 2. Don't overload circuits. 3. Keep away from live conductors. 4. Ground an electrical tool before use. Discusses the common causes of electrical burns and injuries.

#13. INDUSTRIAL POWER TRUCKS

Discusses parking, loading, inspecting trucks, and safe driving practices. Illustrates the wrong ways to use a truck. Covers operating in close quarters, the safe way to approach and enter an elevator, etc. Drives home the main causes of plant truck accidents.

#14. ONLY A SCRATCH

Goes to work on how to get workers to use first-aid on little injuries. Shows how to treat different types of wounds such as punctures, lacerations, and incisions. Sells workers on the idea that protecting themselves against infection is a sign of good sense.

#15. WANTED—SAFE WORKERS

An informal session on what makes a safe worker. Deals with the worker who understands his job and does it well, and with the fellow who learns the hard way. Covers, in story style, how to act at work, and dress at work. Stresses cooperation between fellow workers.

#16. FALLS

Shows that falls are one of the most serious sources of industrial accidents. It covers everything from plunging down unguarded elevator shafts to stumbling over objects. Shows how to prevent falls and discourages the use of makeshift equipment and horseplay.

#17. DOES YOUR ACCIDENT SHOW?

Attacks the employee's attitudes which lead to accidents. It shows employees the reasons why people pull boners that can lead to injury: being "safety lazy," failure to follow rules, horseplay, distractions, failure to think, not feeling up to par.

#18. MY ACHING BACK!

Treats the subject of back injuries—why and how they happen. The drawings show how the back functions, and what happens when it is strained or twisted. An effective way to drive home the proper ways to lift, and the need for securing help in lifting.

#19. STATIC SPARKS AND FLAMMABLE LIQUIDS

It spares no punches in showing your workers how static sparks are caused, how they ignite flammable liquids, how to bond against these dangers. The information will sink in, take hold, and help every time workers transfer flammable liquids.

#20. OFF-THE-JOB SAFETY

Doesn't mince words. It is designed to help stop the off-the-job accident toll, at home, in recreation and in traffic. It illustrates hazards to watch out for, and makes workers stop, think and watch their step—and play it safe off-the-job.

#21. SAVE YOUR OWN SKIN

Discusses the causes and dangers of dermatitis. It shows workers how to protect their skin; the need for protective clothing, and for keeping it clean and in good condition; discourages the use of solvents, and encourages the use of protective creams, and first aid for all skin infections.

#22. CHEMICAL SPILLS AND SPLASHES

Emphasizes the dangers of liquid chemicals, their safe handling and transporting. It instructs workers to clearly identify them; how to empty drums, carboys and tank cars; what to do when chemicals are spilled, splashed on workers, or if they are overcome by chemical vapors.

#101. WHY BACK INTO TROUBLE?

An illustrated safety talk for commercial truck drivers. It gets down to actual cases and teaches drivers when and why to avoid unnecessary backing, hazards to look for, curb parking hazards, how to back safely, and tells the safe backing speeds.



#102. YOUR MARGIN FOR SAFETY AT INTERSECTIONS

Contains suggestions for commercial vehicle drivers on how to prevent accidents at intersections. It warns to be suspicious of all intersections, to avoid sudden stops, to obey traffic signals, how to make left turns, and to be on the alert for pedestrians.

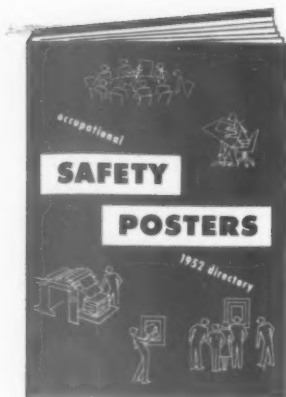
SAFETYGRAPHS ON APPROVAL

If you'd like to look a safetygraph over before purchasing it, just write "Send on approval" on your purchase order. The safetygraph you select will be sent to you for five days free examination. If at that time you decide it does not fit your needs, you may return it. No invoice will be issued.

SEE PAGES 37 AND 38 FOR PRICES

colorful-effective-inexpensive SAFETY POSTERS

are the mass advertising and selling
medium for your safety program



The Council maintains a stock of approximately 1000 different posters covering safety, fire prevention, and health.

The DIRECTORY OF OCCUPATIONAL SAFETY POSTERS illustrates 744 posters in miniature, classified and indexed for easy reference.

Posters are produced in four sizes: "A" size, 8 1/2" x 11 1/2"; "B" size, 17" x 23"; "C" size, 25" x 38" and Jumbo. One "C" size poster and one Jumbo poster are produced each month, and are shown in the poster section of the NATIONAL SAFETY NEWS along with the other new posters produced during the year. All posters shown in the Directory and the NEWS will be available throughout the year.



Those who do not wish to select their own posters may have them selected by Council staff engineers, and shipped automatically each month. Staff engineers make selections each month to provide specialized automatic poster service for 56 different types of operations. See the DIRECTORY OF OCCUPATIONAL SAFETY POSTERS for a complete explanation of automatic poster service, or write the Council for additional information.



JUMBO POSTERS **the BIGGEST thing in Safety!**

BIG in size

They measure nearly 10 feet high by 12 feet wide . . . an impressive safety display that can't be missed!

Set out in front of your plant, Jumbo Posters are seen not only by your own personnel, but also by the residents of your community and the people who pass by. They tell everyone who sees them that yours is a safety-minded company, interested in the welfare of your workers. A wonderful way to win public good will!

BIG in value

Any competent workman can build a Jumbo Poster billboard. Working drawings will be sent on request. Each poster comes in eight sheets for easy handling. The ink and paper used are of the regular outdoor quality, and are weather resistant for at least 30 days. All that is required is a supply of outdoor cooked paste.

Jumbo posters are sold only on annual subscription—12 new posters delivered at monthly intervals.



PAYROLL ENCLOSURES

Miniature black and white reproductions of safety posters may be ordered for use as inserts in pay envelopes. You select 12 different posters from those shown in one color in the poster directory or in NATIONAL SAFETY NEWS. The enclosures are printed 12 to a sheet and then cut to 1 3/4" x 2 1/2" size. Minimum order of 1200 enclosures (100 sheets) is required. Quantities of each of the miniatures selected must be identical. See Directory of Occupational Safety Posters for details.

POSTER ELECTROS

You may obtain electrotypes of any poster illustrated in

black and white in the poster directory or in the poster section of NATIONAL SAFETY NEWS. (Electrotypes of 3 and 4 color posters are not available.) Electrotypes are approximately 1 3/4" x 2 3/4", suitable for use in plant publications and leaflets. Order by poster number.

POSTER FRAMES

Black enameled metal frames, made to fit National Safety Council posters. Especially useful when display boards are not available, or to spot a single poster at a strategic point. Frames are large enough to accommodate cardboard backing and also a glass or plastic sheet in front of the poster.

SEE PAGES 37 AND 38 FOR PRICES

SAFETY FILMS



35mm SOUND SLIDEFILMS

Council sound slidefilms consist of a 35mm filmstrip and a 33 1/3 RPM recording. All film sets and most individual films have a conference leader's manual (discussion outline and quiz). One copy is furnished with each film purchased.

Filmstrip or record replacements for sound slidefilms may be purchased at 1/4 the price listed for the complete film, provided the damaged part is returned with the order. Otherwise, cost of either replacement is 1/2 the price listed for the complete film.

PREVIEWS—Films will be sent on approval. Preview service charge is applied against the purchase price if the film is retained.

WORKER TRAINING COURSE

This group of ten 35mm sound slidefilms is designed to give workers a well-rounded basic course in safety. Each slidefilm and record in this series has been prepared specifically as an industrial training tool. The Leader's Manuals contain instructions for holding 10 stimulating safety meetings, quizzes on the subject matter of each film, and discussion outlines. Everything is planned, even an exact time schedule for the meetings. Set includes leatherette-bound carrying case. Purchase Item #171.00. Rental Item #172.00

LEARN AND LIVE

Presents the 10 basic rules of industrial safety. This film lifts these rules from your company rule book; brings them to life with action shots showing how and why they are applied—what happens when they are ignored. 15 minutes. (Class I Film) Purchase Item #171.20. Rental Item #172.20

FIFTEEN MINUTES TO GO

Dramatizes the extreme risk involved in delaying or neglecting first aid for all injuries. Convinces workers that it's smart to get first aid immediately—for even the tiniest hand or finger cut, harmless-seeming burns. 15 minutes. (Class I Film) Purchase Item #171.10. Rental Item #172.10

SAFE HANDLING OF MATERIALS

One-fourth of all industrial accidents involve handling of materials. Films shows how foremen can give effective instructions on how to lift and carry, how to avoid sprains, strains, hernias, mashed fingers and toes. 15 minutes. (Class I Film) Purchase Item #171.26. Rental Item #172.26

NO LAUGHING MATTER

Typical plant scene showing group of safety people discussing falls; how they can be prevented. Group starts off with a discussion of falls involving vehicles; proceeds to ladders and scaffolds. Winds up with miscellaneous fall hazards. 15 minutes. (Class I Film) Purchase Item #171.22. Rental Item #172.22

SAFE IN HAND

Consists of two filmstrips—Part I, Machinist's Tools and Part 2, Maintenance Tools; a two-sided record. Part 1, illustrates safe practices in use of hammers, chisels, wrenches, pliers, screwdrivers; Part 2—saws, axes, pinch bars, crow bars, and jack. 20 minutes. (Class I Film) Purchase Item #171.27. Rental Item #172.27

KEEP IT CLEAN

Put across the idea that any plant can be kept clean if everyone pitches in. Shows before-and-after pictures of house-keeping conditions; how to interest workers in keeping the plant clean; the trouble spots that need special attention. 15 minutes. (Class I Film) Purchase Item #171.19. Rental Item #172.19



STOP THE FIRE THIEF

Deals with the causes of industrial fires and how safe practices will eliminate those causes. Discusses improper handling and storage of flammable liquids, defects in electrical equipment, welding torch sparks, open heating equipment, smoking and poor housekeeping. Also available in slide motion. 13 minutes. (Class I Film) Purchase Item #171.29. Rental Item #172.29

WHAT'S YOUR SAFETY I.Q.?

Film on off-the-job safety intended for employee use, but may be used by any group. Dealing with safety in the home, in traffic and recreation, with audience participation in solving the quizzes. The Quiz pictures show a number of "what's wrong with this picture?" Also available in sound motion. 15 minutes. (Class I Film) Purchase Item #171.35. Rental Item #172.35

EASY ON THE EYES

Makes your workers eye-protection-wise. Shows the various types of glasses for specific jobs and stresses three rules: proper fitting, wear the correct protection, keep them clean. Also available in sound motion. 20 minutes. (Class I Film) Purchase Item #171.07. Rental Item #172.07

CAUSE AND CURE (From Safety Management For Foremen Series)

Points out that too many foremen pass the buck to their workers when they have to report on an accident. Shows that accidents have definite causes—and cures. Illustrates unsafe acts and conditions that foremen should look for. 20 minutes. (Class II Film) Purchase Item #171.04. Rental Item #172.04

A GREAT NEW SERIES FOR WORKERS

PERSONAL SIDE OF SAFETY

Here is the new film sequel to the popular "Human Factors In Safety"—but designed for your workers and their foremen! These films help you to influence your worker's attitudes, personal feelings, thinking, and emotions toward safety. They show your workers how to know their jobs, their environment, themselves—and that safety is within their personal control. The five new films are available in 16mm and 35mm sound slidefilms. Purchase Item #171.44. Rental Item #172.44

SAFETY RECORD

Shows your workers that they're playing a winner when they play safety—it's popular, modern, successful. Company records are illustrated to prove safety success—and show that safety is accomplished by the individual. 15 minutes. (Class XV Film) Purchase Item #171.45. Rental Item #172.45

TWO STEPS TO SAFETY

Shows that safety is the result of knowledge—knowing your job, and your environment!—and knowing yourself! These two steps dramatically drive home the effects of knowledge on personal safety. 15 minutes. (Class XV Film) Purchase Item #171.46. Rental Item #172.46

LET HABIT HELP

Safety lies in the kind of habits we have . . . good habits . . . or dangerous habits. Shows the worker how to analyze himself . . . how to build up good habits that lead to safety. 15 minutes. (Class XV Film). Purchase Item #171.47. Rental Item #172.47

CAUSE FOR ALARM *

Instructs worker on the control of fires, how to turn in an alarm, how to meet situations in an emergency. It shows in simple fashion how the various classes of fire extinguishers are used and explains the theory of combustion. Also available in 16mm motion. 13 minutes. (Class I Film) Purchase Item #171.05. Rental Item #172.05

FREIGHT HANDLING SAFETY *

The main emphasis is on freight car and motor truck loading hazards; the safe way to open freight car doors; lowering and anchoring dock plates; how to handle "sleepers"; how to lift, carry, pile, and use hand trucks. Also available in 16mm motion. 11 minutes. (Class I Film) Purchase Item No. 171.13. Rental Item #172.13

MY EYE DEAL

Colored cartoon film that combines goggles with goggles. Tells the story of Herkimer, and how he learned the value of wearing safety goggles. It's a story with a moral that workers don't soon forget. 10 minutes. (Class IV Film) Purchase Item #171.21. Rental Item #172.21

INVISIBLE RED INK

An appeal to business management to recognize the importance of a planned safety program, not only for humanitarian reasons, but from an actual dollars and cents standpoint. 20 minutes. (Class VI Film) Purchase Item #171.18

WOODWORKING MACHINES

Gus, an old, safety-wise woodworker, takes two new safety committee recruits through the shop. Emphasizes the value of machine guards on saws, splitters, jointers, shapers, and planers. 17 minutes. (Class I Film) Purchase Item #171.37. Rental Item #172.37

LABORATORY GLASSWARE

The majority of laboratory accidents are caused by improper or careless handling of glass equipment. This film shows the precautions to observe in handling glass. 10 minutes. (Class I Film) Purchase Item #171.69. Rental Item #172.69

GIANT HANDS OF INDUSTRY

Points out that the two main causes of crane accidents are failure to use correct hand signals and failure to keep in the clear. Illustrates standard hand signals and safety tips. 15 minutes. (Class I Film) Purchase Item #171.15. Rental Item #172.15

CONSTRUCTION EQUIPMENT SAFETY

A dozen unsafe acts cause three out of four accidents with construction equipment. Film illustrates these mistakes; tells the safety rules all workers should observe. 20 minutes. (Class I Film) Purchase Item #171.63. Rental Item #172.63



GET A GRIP ON YOURSELF

Points out that we must establish controls so that emotions don't get the upper hand—shows how to recognize emotions, what causes them, how to control them . . . with suggested methods of control. 15 minutes. (Class XV Film) Purchase Item #171.48. Rental Item #172.48

DECIDE TO BE SAFE

We can all be safer by deciding to be safe—it's up to us! By building up a bank of safety knowledge . . . we have a fund ready to help us in any situation that may arise. 15 minutes. (Class XV Film) Purchase Item #171.49. Rental Item #172.49

* Sound slidefilms marked with this symbol are produced in a new form known as the 30-50 low frequency signal. One side of the sound slide film recording uses an inaudible signal for automatically advancing each picture in synchronization with the narration on the recording. The other side of the record has the audible signal for advancing the film manually. Special projectors are needed to operate films on the inaudible signal side. In the future, all new films will be produced in this double form.

SEE PAGES 37 AND 38 FOR PRICES

35 mm SLIDEFILMS



JACKHAMMER SAFETY

Emphasizes importance of protective equipment, keeping jackhammer in good condition. Illustrates standard safe practices in drilling and blasting. Silent film strip. (Class VII Film) Purchase Item #171.67. Rental Item #172.67

BUILDING CONSTRUCTION SAFETY

This film is aimed directly at the old superstition that each story of a building is paid for with the life of a worker. Covers demolition, steel scaffolding, ladders, unguarded floor openings, concrete placement, material hoists, housekeeping, etc. Silent film strip. (Class VII Film) Purchase Item #171.62. Rental Item #172.62

SAFE HAULAGE IN COAL MINES

Pictures are based on actual accident experience. Discusses maintenance hazards of motors and cars. Silent filmstrip. (Class VII Film) Purchase Item #171.74. Rental Item #172.74

BLASTING SAFELY IN MINES

Demonstrates the "know how" and skill of using explosives safely. Also discusses storage of explosives. Silent film strip. (Class VII Film) Purchase Item #171.60. Rental Item #172.60

MINUTE MEN

Dramatizes the hazards involved in the work of utility company linemen—the safety precautions they must observe. Also safety rules for boiler room, substation, meter department workers. 20 minutes. (Class I Film) Purchase Item #171.72. Rental Item #172.72

SAWMILL SAFETY

A safety tour through a sawmill—illustrating safety precautions from the pond through all operations to the piling machine. Also first aid, housekeeping, and protective equipment. 17 minutes. (Class I Film) Purchase Item #171.76. Rental Item #172.76

TIMBER

Presents a session of a logging company's safety committee. Topics discussed: walking on logs; falling hazards; avoiding injuries from axes and saws, widow makers, line and gear, and other common hazards. 17 minutes. (Class I Film) Purchase Item #171.77. Rental Item #172.77

WOVEN WITH SAFETY

Discusses major causes of accidents in textile mills; improper material handling, machinery hazards, compressed air, knives, scissors. Stresses importance of first aid. 15 minutes. (Class I Film) Purchase Item #171.79. Rental Item #172.79

PACKED WITH SAFETY

A film produced specifically for the meat packing industry. Stresses the importance of using caution in working with knives. Also discusses protective equipment, first aid, lifting. 15 minutes. (Class V Film) Purchase Item #171.73. Rental Item #172.73

KEEP 'EM ROLLING

Railroad film in which a car foreman and a railroad safety officer tell about the precautions every car man must take to protect himself and others from injury. 15 minutes. (Class I Film) Purchase Item #171.68. Rental Item #172.68

MEN AND MOTIVE POWER

Dramatizes the precautions to observe in railroad roundhouse and shop work. Discusses falls—how they can be eliminated. Shows correct use of tools, importance of protective equipment. 15 minutes. (Class VIII Film) Purchase Item #171.70. Rental Item #172.70

SAFELY WE WORK

Railroad film. Shows how to get on and off a moving car, how to climb tank ladders. Discusses hand, power and air brakes; walking between and across tracks; coupling and cutting cars. 15 minutes. (Class V Film) Purchase Item #171.75. Rental Item #172.75

MEN OF MAINTENANCE

A know-how film for railroad maintenance men. Illustrates the precautions to be observed in operating motor track car, on all types of maintenance equipment, on or near third rail. 15 minutes. (Class I Film) Purchase Item #171.71. Rental Item #172.71

Motor Transportation

SMOOTH OPERATION+

Dramatizes the endless distractions and delays of city driving, shows how the traffic fighter makes driving tougher on himself; and how the only way to cope with traffic is to cultivate the fine points of smooth operation. 16 minutes. (Class I Film) Purchase Item #278.11. Rental Item #278.61

DEFENSIVE DRIVING

Dramatizes the principles of defensive driving—keeping equipment in safe condition, follow at safe distances, stop slowly, use hand signal, brake at safe distance, drive courteously. 20 minutes. (Class I Film) Purchase Item #278.01. Rental Item #278.51

IF IT HAPPENS

Tells what to do in case of an accident —1. Keep the accident from getting worse; 2. Get and record all the facts; 3. Get you and your vehicle back on job as soon as possible. Many other tips. 20 minutes. (Class I Film) Purchase Item #278.02. Rental Item #278.52

P. U. D. DRIVER WINS AGAIN

Typical day in the life of a pick-up and delivery driver. Shows how professional driver resists temptation to exceed speed limits, neglect hand signals, turn from wrong lane. 20 minutes. (Class I Film) Purchase Item #278.04. Rental Item #278.54

PILOTS OF THE HIGHWAY

Moves from the first interview through training program to time driver becomes full-fledged "pilot of the highway." Tells of the many things a professional driver has to learn. 20 minutes. (Class I Film) Purchase Item #278.03. Rental Item #278.53

CAUTION AT THE CROSSROADS

An instruction film for commercial vehicle drivers, dealing with intersection accidents, and how to avoid them. 11 minutes. (Class XII Film) Item #278.59

DANGER IN REVERSE

Accident on backing accidents, with three simple steps for drivers to follow to avoid vehicle and property damage, and accidents with pedestrians. 8 minutes. (Class XII Film) Item #278.59

TOO CLOSE FOR COMFORT

Explains how tailgating by drivers results in city and highway crackups; causes public anger toward commercial drivers. 8 minutes. (Class XII Film) Item #278.59

TOO FAST FOR CONDITIONS

Clears up a widely misunderstood subject, showing how unsafe speeds may often be below the legal limit. 9 minutes. (Class XII Film) Item #278.59

Public Safety

FOR YOU AND YOURS

Narrated by Vincent Pelletier, features Edw. G. Robinson and the Dinning Sisters, it tells what can be done to prevent accidents. 20 minutes. (Class VI Film) Item #079.01

ARE YOUR FEET KILLING YOU?

Hits hard at the causes of pedestrian accidents. Illustrated with actual case histories of pedestrian accidents. 20 minutes. (Class IX Film) Item #379.01

IT'S YOUR HOME—PLAN IT SAFELY

Shows how to build safely into the home. Discusses stairs, kitchens, closets, plumbing, heating and electricity. 20 minutes. (Class IX Film) Item #579.02

MARY JONES GOES TO COURT

Shows how the Police Department, through engineering, education, and enforcement, tries to prevent accidents. 20 minutes. (Class IX Film) Item #379.02

NO USE SKIDDING

Film that dramatizes the hazards of winter driving—and shows how to avoid them. Discusses braking on snow and glare ice, other driving tips. 20 minutes. (Class IX Film) Item #379.31

ON RECORD

Most states require a written report of any accident involving an injury or damage over \$25.00. Shows procedure for preparing, filing and how used. 20 minutes. (Class IX Film) Item #379.03

TRAFFIC JAM AHEAD

Illustrates intensified traffic hazards. Outlines program for traffic safety. 20 minutes. (Class IX Film) Item #379.05

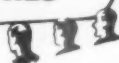
TESTING THE DRINKING DRIVER

A dramatic story of scientific tests used in drunk driving cases. 20 minutes. (Class IX Film) Item #379.04

SIGNS OF LIFE

Narrated by Eddie Cantor, the film deals with all the signs and signals to be found along the highway and in city traffic. Learning to recognize those signs and signals by their shape is stressed. (Class X Film) Item #379.41

16 mm MOTION PICTURES



FOR SAFETY'S SAKE

Shows how to use, inspect, and care for portable power tools—specifically drills, grinders, saws and electrical tools. 15 minutes. (Class XI Film) Purchase Item #171.12. Rental Item #172.12

HOME SAFE HOME

Shows how every member of the family can help eliminate home hazards and avert tragedy. 12 minutes. (Class III Film) Purchase Item #579.01. Rental Item #579.51

SIMULATED MOTION—The films listed below have the same subject matter as the sound slidefilms bearing the same titles, but employ a new technique in visual education. These films combine motion with still pictures and special optical effects to give motion sequence.

FREIGHT HANDLING SAFETY

See page N-31 for description. 11 minutes. (Class XIII Film) Purchase Item #171.14. Rental Item #172.14

CAUSE FOR ALARM

See page N-31 for description. 13 minutes. (Class XIII Film) Purchase Item #171.06. Rental Item #172.06

STOP THE FIRE THIEF

See page N-30 for description. 13 minutes. (Class XIII Film) Purchase Item #171.30. Rental Item #172.30

EASY ON THE EYES

See page N-30 for description. 15 minutes. (Class XIII Film) Purchase Item #171.08. Rental Item #172.08

WHAT'S YOUR SAFETY I.Q.?

See page N-30 for description. 15 minutes. (Class XIII Film) Purchase Item #171.36. Rental Item #172.36

PERSONAL SIDE OF SAFETY

Worker Training Film Set
See page N-31 For Descriptions

SAFETY RECORD

13 minutes—(Class XVI Film) Purchase Item #171.51. Rental Item #172.51

TWO STEPS TO SAFETY

13 minutes—(Class XVI Film) Purchase Item #171.52. Rental Item #172.52

LET HABIT HELP

13 minutes—(Class XVI Film) Purchase Item #171.53. Rental Item #172.53

GET A GRIP ON YOURSELF

13 minutes—(Class XVI Film) Purchase Item #171.54. Rental Item #172.54

DECIDE TO BE SAFE

13 minutes—(Class XVI Film) Purchase Item #171.55. Rental Item #172.55

SMOOTH OPERATION

See description on page 32. 16 minutes. (Class XIII Film) Purchase Item #278.12. Rental Item #278.62

RENTAL FILMS

Rental service is available only within the continental limits of the U.S.A. Rental limit is two weeks unless special arrangements are made through the Council's Membership Department.

Industrial

THE SAFETY SLEUTH

An M-G-M Pete Smith short showing how accidents occur, and how the causes be ferreted out and remedied by an alert safety engineer. 10 minutes. (Class XII Film) Item #172.28

EYE ACCIDENTS

Illustrates methods of eye protection for workers engaged in underground mining. Silent. 15 minutes. (Class XII Film) Item #172.65

BURNING—THE SAFE WAY

Discusses the safe-guards every burner should take; proper dress; safe work methods; use of safety equipment provided. 28 minutes. (Class XII Film) Item #172.02

WELDING—THE SAFE WAY

An industrial training film that discusses and illustrates safe working methods for welding operations. 18 minutes. (Class XII Film) Item #172.34

DIAGNOSIS DANGER

Inaugurating a comprehensive safety program in a hospital. 20 minutes. (Class XIV Film) Item #172.64

CARE AND USE OF HAND TOOLS

Six motion pictures illustrating the safe use and care of hand tools. Shows generally accepted rules for handling specific tools with complete safety. Each film must be booked individually. (All are Class XII Films) Item #172.03

WRENCHES

20 minutes—Item #172.03A

PLIERS AND SCREWDRIVERS

17½ minutes—Item #172.03B

CHISELS

12 minutes—Item #172.03C

HAMMERS

11 minutes—Item #172.03D

PUNCHES, DRIFTS AND BARS

14 minutes—Item #172.03E

HACK SAWS

18 minutes—Item #172.03F

BREATH OF LIFE

A color film outlining the methods of applying tree-top resuscitation to tree trimmers who have come in contact with power lines. 15 minutes. (Class XII Film) Item #172.61

Motor Transportation

THE OPERATOR AND SAFETY

Discusses safety measures for city bus operators: safety checks, safe following distance, passing, etc. 19 minutes. (Class XII Film) Item #278.55

THE TRUCK AND THE DRIVER

Illustrates safe driving practices in cities, and on county highways. Covers truck operation and maintenance. 10 minutes. (Class XII Film) Item #278.56

THEY DRIVE IN SAFETY

A training film that shows the requirements for commercial vehicle drivers. 12 minutes. (Class XII Film) Item #278.57

IT'S A BIG JOB

An induction film for streetcar and bus employees, shows the prospective operator a preview of his job: what it calls for a preview of his job. 25 minutes. (Class XII Film) Item #278.58

CAUTION AT THE CROSS ROADS

See page N-32 for description. 11 minutes. (Class XII Film) Item #278.59

DANGER IN REVERSE

See page N-32 for description. 8 minutes. (Class XII Film) Item #278.59

TOO CLOSE FOR COMFORT

See page N-32 for description. 8 minutes. (Class XII Film) Item #278.59

TOO FAST FOR CONDITIONS

See page N-32 for description. 9 minutes. (Class XII Film) Item #278.59

Public Safety

MEN AT THE WHEEL

A "March of Time" film. It singles out for special condemnation the driver who is always taking a chance. 12 minutes (Class XIV Film) Item #379.58

SAFETY IN THE HOME

Covers many hazards existing in the home. Uses negative instruction technique. 10 minutes (Class XIV Film) Item #579.53.

SCREWDRIVERS AND SCREWJAYS

Features Lew Lahr, movie comedian, as a screwy driver, and Don Wilson, radio announcer, as a screwy jaywalker. 10 minutes (Class XIV Film) Item #379.54

THE CHANCE TO LOSE

Illustrates the tremendous chances taken by many drivers, and compares it with various forms of gambling. 10 minutes (Class XIV Film) Item #379.52

WHAT PRICE HAPPINESS

Discusses and illustrates the common causes of home accidents, and how these accidents may be prevented. 10 minutes (Class XIV Film) Item #579.54

X MARKS THE SPOT

A story relating the traffic experiences of a somewhat whimsical—though typical driver and pedestrian. 20 minutes (Class XIV Film) Item #379.57

TRAFFIC WITH THE DEVIL

An M-G-M film, presenting the dangers of motor traffic today. 17 minutes (Class XIV Film) Item #379.56

HIGHWAY MANIA

A documentary picture on traffic accidents, and the toll of life and limb. 12 minutes (Class XIV Film) Item #379.53

THE SEVENTH COLUMN

An M-G-M Pete Smith short shows how carelessness is the cause of unnecessary accidents in the home, factory, and on streets. 10 minutes (Class XIV Film) Item #079.52

SEE PAGES 37 AND 38 FOR PRICES

complete MOTOR TRANSPORTATION Service.



***the highest honor
a professional driver
can receive.***



SAFE DRIVER AWARD

The heart of the program is the SAFE DRIVER AWARD. No award carries more weight among professional drivers...or commands greater respect from transportation operators. It is recognized as the national standard for safe driving achievement.

Qualified drivers employed by installations using the Complete Motor Transportation Service receive this gold-plated award each year; it cannot be purchased. Available in three forms—cap or lapel pin, and key chain—accompanied by an individual certificate of qualification.

The materials pictured on these two pages can be provided regularly through the Council's Complete Motor Transportation Service. They are designed to:

- 1 Inspire the "want-to" for driving safely
- 2 Provide the reminder materials, so necessary in building a safe driving attitude
- 3 Provide the information and materials necessary to administer an effective driver safety program

This service is described more fully in Service Guide 106.1. Most of the items can be purchased individually at the prices shown on pages 37 and 38. Tables showing the exact service and charges are on page 36.

FOR EXPERTS ONLY

A handsome, colorful booklet that tells drivers on keeping a perfect no-accident record. Gives the rules for qualifying for the National Safety Council Safe Driver Award, and stresses the safety measures that must be taken to stay clear of the situations that cause accidents. One copy is provided each driver during the first year of service; in succeeding years, one copy for every five drivers.

24 pages
5 1/2" x 8 1/2"



NATIONAL

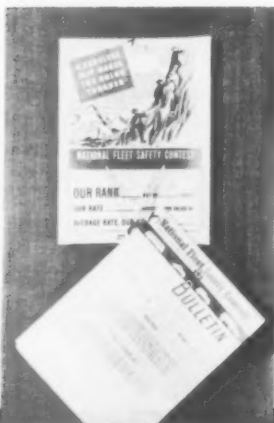
FLEET SAFETY

CONTESTS

Your fleet can compete in 1 of 27 divisions, depending on your operations and equipment. Awards are presented to fleets in each division having lowest accident rates. The Council furnishes a monthly bulletin showing your fleet's current rank in the contest and a colorful poster to announce your competitive position to the drivers.

SAFETY POSTERS for drivers

Here is the world's largest supply of driver safety posters! Fresh, Colorful—highlighting important safe driving fundamentals—keyed to season, weather and utility with subjects tailored to the needs of motor transportation operators. Two sizes are available: large (17" x 23"); small (8 1/2" x 11 1/2"). You receive one or more poster sets, depending on the number of drivers you have. A set includes two different large and two different small posters each month for one year. Additional sets should be purchased to provide a weekly change of posters for every bulletin board.



an effective and integrated program for drivers

SAFE DRIVER MAGAZINE

A big package of safety in capsule form, the **SAFE DRIVER** influences drivers to accept responsibility for equipment, encourages safe driving habits, sells drivers on the benefits of safety.

This popular pocket-size publication is issued monthly and is written in language drivers understand and believe. Drivers enjoy the clever cartoon illustrations, like the common sense approach to safe driving. A copy for each driver. 16 pages, size 3 3/4" x 5 1/2".

DRIVER LETTERS

Individual monthly letters on Council letterheads. Short, to-the-point safety messages...informal, chatty reminders on specific accident hazards. They are cleverly cartooned and written in the driver's own language. They cover the normal high frequency and high severity accident causes, in addition to seasonal hazards. The Service provides a letter for each driver each month.

FLEET SAFETY MANUAL

The Fleet Safety Manual shows you how to organize and conduct an effective safety program. It consists of seven parts and supplementary material in a rich maroon loose-leaf binder. The sections include information on: Fleet Safety Program—a general discussion of accident prevention techniques and how they may be organized into a safety program; Selection of Drivers; Driver Training; Accident Reports and Records—a recommended system of recording and analysis including sample forms; and many other specific subjects.

NEWS LETTERS

As a user of the Complete Motor Transportation Service, you are enrolled in one or more Sections of your choice. These Sections act as a clearing house of information and bring you in contact with other fleets through the medium of Section news letters. Ideas and activities discussed in the two transportation news letters, **FLEET FLASHES**, and **TRANSIT TOPICS**, have been proved successful by other fleets.

Other Publications

Fleets subscribing to the Complete Motor Transportation Service also receives a copy of **ACCIDENT FACTS**, (shown on page N-3) the appropriate volumes of **CONGRESS TRANSACTIONS**, (shown on page N-9) and the **ACCIDENT RATES PAMPHLET** for motor transportation fleets.

See the following page for table of services and charges; pages 37 and 38 for prices of individual items.



PUBLIC SAFETY MAGAZINE

PUBLIC SAFETY is the best single source of up-to-the minute information in the traffic safety field. Its 32 pages feature stimulating articles by fleet and traffic safety experts, current accident statistics, news of accident prevention, reviews of new safety publications, etc. You receive **PUBLIC SAFETY** every month as part of your Complete Motor Transportation Service.



complete MOTOR TRANSPORTATION Service

The charges shown in the box apply only to organizations already holding Industrial, Insurance Company or Transportation Company memberships in the Council. Insurance agencies and companies holding a Complete Transportation Membership pay a slightly higher charge to cover the dues allocated to the Council's basic services. Non-members should write for appropriate service charges.

ANNUAL SERVICE CHARGE

No. of Drivers	Cost per Driver
1 to 9	\$22.50*
10 to 19	2.45
20 to 29	2.10
30 to 49	1.80
50 to 74	1.60
75 to 99	1.50
100 to 199	1.35
200 to 399	1.25
400 to 699	1.15
700 to 999	1.10
1000 to 1999	1.00
2000 to 4999	.95
5000 or more	.90

* Per Fleet, Minimum Charge.

SERVICE TABLE

Number of Drivers	1 to 9	10 to 49	50 to 99	100 or more
1. Fleet Manual, as issued (large) Fleet Manual, as issued (small)	— 1	1 —	1 —	1 —
2. Automatic Posters No. of 8 1/2 x 11 1/2" posters, monthly No. of 17 x 23" posters, monthly	2 2	2 2	4 4	8 8
3. Public Safety Magazine, monthly	1	1	1	1
4. Sectional Enrollment No. of Sections	1	2	2	2
5. Sectional News Letters No. of Copies, monthly	1	2	2	2
6. Accident Facts, annually	0	1	1	1
7. Accident Rates Pamphlet, annually	0	1	1	1
8. Congress Transactions, annually General Section Meetings	1 1	1 2	1 2	1 2
9. National Safety Calendar	1	1	1	1
10. Safe Driver Magazine	One Monthly Copy for Each Driver			
11. Safe Driver Awards	One Annually for Each Eligible Driver			
12. For Experts Only (Award Rules)	One copy per each Driver first year, one copy per 5 drivers thereafter.			
13. Driver's Letter, monthly	One Monthly Copy for Each Driver			
14. Participation in the National Fleet Safety Contest	Contest begins July 1 each year and runs to June 30 of following year.			

optional safety publications



DASH CARDS

Another good device to keep your drivers safety-awake when behind the wheel... colorful, attractive, and cartoon illustrated. These 3" by 6" cards slip into metal holders fastened to the dashboard. Subscription includes 24 cards, printed on both sides—enough for 4 changes per month. Metal holders are free with each set. Specify Bus or Truck when ordering. Special discount when ordered with the Complete Motor Transportation Service.

THE YOU FACTOR IN ACCIDENT CAUSES

Aimed at the basic, underlying personal factors that cause transportation accidents. Its 24 pages strike home with every YOU factor from temper to worry. Clever cartoons invite reading, while short, to-the-point text spares no punches in showing drivers how important these factors are in accident causes. 3 1/2" x 5 1/2"

VISUAL TRAINING AIDS

Descriptions of 35mm sound slidefilms are given on page N-32; 16 mm motion picture films on page N-33. Fleet Safetygraphs #101 and #102 are described on page N-27.

DEFENSIVE DRIVING

Popular 24-page booklet that combines good fun with sound tips on good driving. Cartoon illustrations picture the folly of aggressive or careless driving habits. Reminds drivers that safe, courteous driving is good public relations. Size 3" x 5". Specify "Truck" or "Bus."

EXPERTS DON'T SKID

Cartoon-illustrated leaflet presenting sound tips on safe winter driving. Prepared by Committee on Winter Driving Hazards. 4" x 6".

FLEET SAFETY MEMOS

2. Fleet Safety Posters, 1950.
3. Publicity Procedure When Presenting Safe Driver Awards, 1950.
10. Protective Coloring for Commercial Vehicles, 1950.
13. Safety Meetings for Commercial Drivers, 1950.
16. Investigating Commercial Vehicle Accidents, 1950.

ACCIDENT RECORDS AND FORMS

Record forms prepared for transportation companies to enable them to keep up-to-the-minute information on their accident experience. Order by number and title.

- VEH- 1—Commercial Vehicle Report (8 1/2" x 11"—2 sides).
- VEH- 2—Accident Report Package Envelope (4 3/4" x 8"—2 sides).
- VEH- 3—Commercial Vehicle Driver Record Card (8 1/2" x 11"—2 sides).
- VEH- 4—Commercial Vehicle Accident Analysis (8 1/2" x 11"—1 side).
- VEH- 5—Commercial Vehicle Accident Analysis (Long Form) (11" x 16 1/2"—1 side).
- VEH- 6—Award and Accident Record (5" x 8"—2 sides).
- VEH-10—Safe Driver Award Record Card (10 1/4" x 16"—1 side).
- VEH-12—Witness Card (3" x 5"—1 side).

INDEX AND PRICE LIST

Write for quotations on quantities of 5,000 or more. Non-member prices are double these member prices, except items marked with asterisk (*).

MEMBER PRICES

	1 to 9	10 to 99	100 to 999	1,000 to 4,999	Page #
Accident Analysis Chart, pads of 50, ea.	\$ 1.05	\$ 1.00	\$ 0.90	\$ 0.85	7
Accident Facts*, ea.	.75	.65	.55	.50	3
Accident Facts Memoirs—see Special Releases					
Accident Prevention Manual, ea.	9.00	8.50	8.00	8.00	4
Section Reprints, ea.	.75	.60	.50	.45	4
Accident Rates Pamphlets, ea.	.35	.35	.29	.29	7
Accident Record Forms, Industrial					
IS-1A, IS-3, IS-4, IS-5A, IS-7, IS-8, ea.	.06	.023	.017	.015	36
IS-6 (pads of 100), ea.	.35	.35	.35	.35	36
Accident Record Forms, Transportation					
Veh-1, Veh-4, Veh-6, Veh-12, ea.	.08	.023	.017	.015	36
Veh-3, ea.	.08	.035	.029	.023	36
Veh-2, Veh-5, ea.	.12	.08	.044	.044	36
Veh-10, ea.	.23	.17	.138	.12	36
Administrative Unit—AA-1	23.00	—	—	—	11
A-1	17.50	—	—	—	—
B-1	14.00	—	—	—	—
C-1	8.50	—	—	—	—
A-2	18.00	—	—	—	—
B-2	11.00	—	—	—	—
C-2	7.00	—	—	—	—
B-11	14.00	—	—	—	—

American Standard Safety Code for

Building Construction, ea.	1.15	1.15	1.15	1.15	7
Area's People Ferry*, ea.	.12	.07	.06	.045	20
5,000 to 9,999, \$0.04; 10,000 to 19,999, \$0.035; 20,000 or more, \$0.03.					
Construction Job Manual, ea.	13.20	12.60	12.00	11.40	7
Cry Wheals*, ea.	.12	.07	.06	.045	20
5,000 to 9,999, \$0.04; 10,000 to 19,999, \$0.035; 20,000 or more, \$0.03.					
Dash Cards, sets ea.	.69	.58	.44	.40	36
Data Sheets, any selection, ea.	.17	.13	.08	.07	6
Current Set, including Binders, ea.	19.50	18.00	17.50	17.50	6
Binders, 1/2", ea.	3.00	3.00	3.00	3.00	18
Decalcomanias, any selection, ea.	.12	.07	.058	.044	18
Defensive Driving, Bus or Truck, ea.	.17	.10	.08	.068	36
Detail Sheets, any selection, ea.	.12	.09	.08	.07	8
Current set including binder, ea.	10.20	9.50	9.00	8.00	34
Driver Letter, subscription, ea.	.52	.40	.29	.26	34
Driver's Lucky Seven, ea.	.10	.06	.045	.035	21
5,000 to 9,999, \$0.03; 10,000 to 19,999, \$0.028; 20,000 or more, \$0.026.					
Engineering Studies—see Special Releases					
Experts Don't Skid, ea.	.06	.02	.017	.015	9
Fall Guy, The, ea.	.12	.07	.06	.045	21
5,000 to 9,999, \$0.04; 10,000 to 19,999, \$0.035; 20,000 or more, \$0.03.					

FILMS

Class I Films, ea.	Single	2 to 9	10 or more	Rental	
Class II Films, ea.	copy	copies	copies	Preview	
Class III Films*, ea.	\$ 20.50	\$ 19.50	\$ 18.40	\$ 5.00	
	13.80	13.20	12.60	5.00	
	34.50	33.00	31.00	5.00	

Class IV Films, ea.	27.50	26.50	25.00	5.00	Page #
Class V Films, ea.	8.00	7.50	6.90	2.00*	
Class VI Films*, ea.	8.00	7.50	6.90	Free Loan	
Class VII Films, ea.	11.50	10.90	10.35	3.00	
Class VIII Films, ea.	40.00	34.50	28.50	5.00	
Class IX Films*, ea.	10.00	9.50	9.00	Free Loan	
Class X Films*, ea.	4.50	4.50	4.50	Free Loan	
Class XI Films, ea.	60.00	57.00	54.00	5.00	
Class XII Films, ea.	NOT FOR SALE	NOT FOR SALE	NOT FOR SALE	5.00	
Class XIII Films, ea.	52.00	49.00	46.00	5.00	
Class XIV Films*, ea.	15.00	14.00	13.50	5.00	
Class XV Films*, ea.	40.00	38.00	37.00	5.00	
Class XVI Films*, ea.	34.50	33.00	32.00	5.00	
Class XVII Films, ea.	115.00	109.00	103.00	7.50*	15
Human Factors in Safety, set of 6 films, ea.	70.00	65.00	63.00	7.50	31
10mm set (5 films)* ea.	190.00	180.00	175.00	10.00	31
Safety Management for Foremen, set of 10 films, ea.	115.00	109.00	103.00	10.00*	14
Speaking of Safety, set of 6 films, ea.	115.00	109.00	103.00	7.50*	15
Worker Film Training Series, set of 10 films, ea.	178.00	172.00	167.00	10.00*	30
Any 9 films in series	167.00				
Any 8 films in series	149.00				
Any 7 films in series	130.00				
Any 6 films in series	115.00				
Any 5 films in series	96.00				

For Preview only. Rental rates are per week or fraction thereof. User pays return charges. User pays shipping charges both ways on Free Loan films.

First Aid Reminders, set of 8, ea.	1 to 9	10 to 99	100 to 999	4,999	Page #
Any selection, ea.	.33	.24	.16	.12	22
Fleet Safety Manual, ea.	.07	.05	.035	.026	
Individual Parts, ea.	8.50	8.00	8.00	8.00	34
Fleet Safety Memos, ea.	.85	.75	.70	.63	
write for quantity prices	.17	—	—	—	36
Follow the Leader, ea.	.10	.06	.045	.035	21
5,000 to 9,999, \$0.03; 10,000 to 19,999, \$0.028; 20,000 or more, \$0.026.					
Foreman's 5 Minute Safety Talks, Book I & II, ea.	1.70	1.50	1.45	1.35	17
For Experts Only, ea.	.23	.21	.17	.15	34
Green Cross Electrol*, ea.	.75	.69	.69	.69	25
1/2", 1", ea.	1.38	1.20	1.20	1.20	
1 1/2" ea.	2.00	1.90	1.90	1.90	
Green Cross Flag*, ea.	9.00	8.50	8.00	8.00	25
Green Cross Pins*, ea.	.44	.33	.29	.23	25
(Add 20% Fed. Excise Tax)					
Happy Vacation, ea.	.10	.06	.045	.035	20
5,000 to 9,999, \$0.03; 10,000 to 19,999, \$0.028; 20,000 or more, \$0.026.					
Have Fun! ea.	.10	.06	.045	.035	21
5,000 to 9,999, \$0.03; 10,000 to 19,999, \$0.028; 20,000 or more, \$0.026.					
Heave-Ho!, ea.	.12	.07	.06	.045	20
5,000 to 9,999, \$0.04; 10,000 to 19,999, \$0.035; 20,000 or more, \$0.03.					
Hold Everything*, ea.	.17	.12	.08	.06	20
5,000 to 9,999, \$0.05; 10,000 to 19,999, \$0.045; 20,000 or more, \$0.04.					
Hospital Safety Service*, ea.	5.00	—	—	—	10
How to Make the Safety Speech, ea.	.69	.63	.58	.58	10
I Just Gave My Seat to a Lady, ea.	.29	.23	.21	.18	22
Illustrated Safety Talks, ea.	5.00	4.70	4.50	4.50	17
Industrial Safety & Health Bibliography, ea.	.58	.52	.46	.46	10

	1 to 9	10 to 99	100 to 999	1,000 to Page
Industrial Safety Guide, ea.	1.15	1.05	1.00	4.99
Industrial Supervisor, subscription, ea.	1.80	1.70	1.65	90 10
Subscription billed monthly, ea.	18	16	145	13
In the Pink, ea.	17	99	37	22
5,000 to 9,999, \$0.45; 10,000 to 19,999, \$0.44; 20,000 or more, \$0.35				
Jumbo Posters, Posters				
K. O. Dix & Dieder, ea.	12	97	36	21
5,000 to 9,999, \$0.44; 10,000 to 19,000, \$0.35; 20,000 or more, \$0.3				
Man With the Badge, The, ea.	40	45	40	35
National Safety News, subscription, ea.	5.50	5.00	4.40	24
Non-member prices, ea.	7.50	6.90	6.30	3
11 new letters, subscription, ea.	1.15	1.00	85	3
No Accident Award Pins				
Bronze (1 to 4 years) ea.	35	30	35	20
Silver Plated (5 to 9 years) ea.	37	32	37	25
Gold Plated (10 to 40 years) ea.	40	35	30	25
[Add 20% Fed. Excise Tax on silver & gold]				
Payroll Enclosures, 1st sheets	11.50	—	—	29
Additional 100 sheets, ea.	1.95	—	—	23
Photocopies, any selection, ea.	12	97	36	21
5,000 to 9,999, \$0.44; 10,000 to 19,999, \$0.35; 20,000 or more, \$0.3				
Poster Directory, ea.	30	40	35	35
Poster Electrol, ea.	3.45	3.45	3.15	29
Poster Frames, "A" size, ea.	1.15	1.00	90	29
"B" size, ea.	1.70	1.40	1.15	29
POSTERS				
"A" size, any selection, ea.	97	95	946	28
5,000 to 9,999 \$0.34; 10,000 to 19,999, \$0.32; 20,000 or more \$0.30				
"A" size, all one poster, ea.	99	95	946	28
"B" size, any selection, ea.	18	15	138	28
5,000 to 9,999, \$0.99; 10,000 to 19,999 \$0.88; 20,000 or more \$0.78				
"B" size, all one poster, ea.	18	15	138	28
5,000 to 9,999, \$0.87; 10,000 to 19,999, \$0.76; 20,000 or more \$0.66				
"C" size, ea.	36	30	275	20
Subscription (12 posters), ea.	3.60	3.00	2.75	20
Jumbo Posters, subscription				
(12 Posters) ea.	49.00	46.00	43.50	29
Subscription, billed monthly, ea.	4.90	4.60	4.35	29
Motor Transportation Poster Sets				
1 to 4 sets, ea.	8.48			34
5 to 49 sets, ea.	44.60			
50 to 999 sets, ea.	44.41			
Psychology of Safety in Supervision, ea.	1.05	1.00	90	16
Public Safety, "a" subscription, ea.	4.00	3.80	3.45	35
[Add \$5.00 for foreign, except Canada & Pan American Union]				
S Pennants, ea.	25.00	23.00	23.00	25
Safe at Home, ea.	17	99	97	21
5,000 to 9,999, \$0.45; 10,000 to 19,999, \$0.44; 20,000 or more, \$0.35				
Safe Driver—same prices as Safe Worker				
Safe 'N' Sound, set, ea.	50	40	35	34
Safe Practices Pamphlet, any selection, ea.	45	40	35	33
Set, in binder, ea.	19.50	18.00	17.50	5
Binder only, ea.	2.50	—	—	5
Safe Railroad, subscription (6 issues), ea.				
5,000 to 9,999, \$2.4; 10,000 to 19,999, \$2.3; 20,000 or more, \$2.2				
Subscription, billed bi-monthly, ea.	99	98	98	19
5,000 to 9,999, \$0.41; 10,000 to 19,999, \$0.39; 20,000 or more, \$0.37				
Single issues, ea.	99	98	98	19
5,000 to 9,999, \$0.48; 10,000 to 19,999, \$0.46; 20,000 or more, \$0.44				
Safe Worker, Subscription (12 issues), ea.	70	66	50	19
5,000 to 9,999, \$4.40; 10,000 to 19,999, \$3.7; 20,000 or more, \$3.5				
Subscription billed monthly, ea.	97	96	96	19
5,000 to 9,999, \$0.34; 10,000 to 19,999, \$0.32; 20,000 or more, \$0.3				
Single issues, ea.	97	96	96	19
5,000 to 9,999, \$0.4; 10,000 to 19,999, \$0.37; 20,000 or more, \$0.35				
Safety Bell Ringers, ea.	36	29	23	10
Safety Contest Trophy, ea.	25.00	23.00	22.00	25
Safetygraphs, complete, ea.	14.55	13.75	13.20	26
Safetygraph, only, any selection, ea.	11.00	10.45	9.90	9.90
Safetygraph Essels only, ea.	3.55	3.30	3.30	26
Safety in Foreman's sets, ea.	1.95	1.70	1.50	16
Safety in Foreman's, ea.	1.05	1.00	90	85
Safety in Quarry Operations, ea.	52	46	40	10
Safety Instruction Cards, any selection, ea.	95	925	919	24
Complete set with file case & guides, ea.	12.65	12.10	11.55	24
Industrial Set including file case and guides, ea.	8.25	7.70	7.15	24
File case & guides only, ea.	2.20	2.10	2.00	24
Safetyman's Library, ea.	65.00	—	—	10
Safety Reprints—see Special Releases				
Safety 'Round the Clock, ea.	10	96	945	9
5,000 to 9,999, \$0.3; 10,000 to 19,999, \$0.28; 20,000 or more, \$0.26				
Safety Talks for Construction & Maintenance Foremen, ea.	1.70	1.50	1.45	17
Safety Training Institute				
Fundamentals of Industrial Safety, \$60.00				
Advanced Course, \$70.00				
Shop Safety, ea.	29	23	17	19
So Help Me, ea.	17	99	97	20
5,000 to 9,999, \$0.45; 10,000 to 19,999, \$0.44; 20,000 or more, \$0.35				
Speaking Straight, Thinking Straight, ea.	26	23	23	10
Special Releases—1 or 2 pages, ea.	10	94	93	9
4 pages, ea.	10	94	93	9
6 pages, ea.	15	99	98	9
8 pages, ea.	15	99	98	9
10 pages, ea.	20	13	11	9
12 pages, ea.	20	15	13	11
16 pages, ea.	20	17	14	12
18 pages, ea.	25	19	15	13
Steps to Safety, ea.	12	97	96	20
5,000 to 9,999, \$0.4; 10,000 to 19,999, \$0.35; 20,000 or more, \$0.3				
Still Waggin', ea.	12	97	96	21
5,000 to 9,999, \$0.4; 10,000 to 19,999, \$0.35; 20,000 or more, \$0.3				
Transactions, sets, ea.	6.00	5.50	5.00	9
Whip Your Weight in Wildcat, ea.	10	96	945	22
5,000 to 9,999, \$0.3; 10,000 to 19,999, \$0.28; 20,000 or more, \$0.26				
Wise Bird Follows the Rules, A, ea.	12	97	96	21
5,000 to 9,999, \$0.4; 10,000 to 19,999, \$0.35; 20,000 or more, \$0.3				
You Factor in Accident Causes, The, ea.	17	10	98	36

SAFETY INCENTIVES

add extra SPARK to your safety program

NATIONAL SAFETY CALENDAR

The annual National Safety Calendar, jam-packed with 'round-the-clock safety tips, enables you to reach right into the home—and include the worker's wife and family in your safety program, too. There's a new "Save-A-Life-Line" limerick contest each month, and everyone from Junior to Grandma joins in the fun . . . to try for big cash prizes! You receive free-of-charge complete promotional tie-in materials to help you build the contests in your plant—and in your workers' homes. Special contest posters, streamers, bulleting, mats and model materials make it easy to promote the contests and spark extra interest in safety. Write the Council for details.

GREEN CROSS FOR SAFETY PENCILS

Here are mobile advertisements for your safety program. The distinctive cap bearing the official Green Cross seal above the clip, rises from the wearer's pocket for all the world to see. It is both a useful tool and a valued badge of recognition. Your company name, a safety slogan or other message of your choice may be imprinted on the pencil. Use them as achievement, suggestion, and

attendance awards; gifts to your safety committeemen. Write for details.

SAFETY PLAYING CARDS

Fifty-four safety lessons with impact, color, novelty, utility! Fifty-four different safety reminders adapted to full-color reproduction from 2-color occupational and off-the-job safety posters. They cover attitudes, lifting, first aid, falls, fire prevention, tools, guarding . . . a complete, balanced selection that tells and retells the principles of safety throughout many, many months of use by all the members of your employees' families.

SAFETY MESSAGE BOOK MATCHES

A series of six different full-color match book covers feature safety reminder messages with broad appeal in every safety program. The match books may be ordered in any one of the designs—or in an assorted series in which all six designs are rotated in individual packages within the case lot of 2500 books. Use this new safety education tool to keep safety in front of your workers . . . on the job or off. Complete details and samples on request.

CONDITIONS AND TERMS

Prices shown in this catalog are effective February 1, 1952, payable U. S. Funds. They are subject to change without notice.

All prices shown are based on a single order for delivery in one shipment to one destination (one shipment per month on annual subscriptions). Quantities are not cumulative over a period of time, or for a number of locations, to obtain quantity prices.

On a single order requesting shipment to more than one location, the price per copy shall be the listed price in the group bracket in which each shipment falls. (Example: Order requesting shipment of 10 copies to each of 19 locations. The total cost of the order will be—19 (locations) \times 10 (copies) \times price per copy in each group (10 to 99).

All prices unless otherwise shown are pre-paid destination within the United States and Canada and Pan American Union. Customs charges will not be paid by the Council. An additional charge equal to 4% of the order will be made on shipment to foreign countries.

Terms of payment on all invoices are 30 day net, except quantity calendar purchases. Annual subscriptions payable in advance.

Remittance should accompany all orders totalling one dollar or less to conserve labor and speed up handling of the order.

Single copies of monthly publications—12 issues annually—can be purchased at 1/10 the annual subscription rate.

Special sorting or packaging, trimming to special sizes or other special handling of publications will, wherever possible, be performed as requested. Service charges will be made for the cost of such work.

IMPRINTING CHARGES

In general, imprinting is limited to three lines. On large posters, imprinting is limited to the right hand half of the lower margin. It is understood that a quantity within 4% above or below the quantity requested will constitute an acceptable delivery on any order requiring imprinting.

Imprinting at time of publication.

Safe Driver, Safe Worker, and all other publications imprinted at time of publication (except calendars), regardless of quantity—per lot or per month on monthly publications . . . \$3.50

On monthly publications, the per lot-per month charge of \$3.50 is effective only when the imprint remains the same during the period of subscription.

Imprinting after publication:

Small posters ($8\frac{1}{2} \times 11\frac{1}{2}$)—1st 1,000 or fraction . . . \$4.50
additional 1,000 or fraction . . . 3.50

Large posters (17×23)—1st 1,000 or fraction . . . \$10.00
additional 1,000 or fraction . . . 7.50

Other publications imprinted after publication, where space permits
1st 1,000 or fraction . . . \$7.00
additional 1,000 or fraction . . . 3.00

Posters presented in four-colors or without a white border cannot be imprinted. Imprinting can be done on all Council publications (outside front and back covers only) provided there is sufficient space and a light background color.

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Ill.

Printed in U.S.A.



Accidents in 1951

Total fatalities up 4 per cent over 1950,
with increases in all classifications but home

THERE WERE approximately 16,000 deaths from occupational accidents in 1951, or 500 more than the 1950 total of 15,500.

The largest increases occurred in the construction and the mining and quarrying industries, in which there were 200 more deaths in 1951 than in 1950. The manufacturing, transportation, service and trade industries had increases of about 100 deaths. Public utilities had the same number of deaths as in 1950. Agriculture was the only industry to show a decrease—300 deaths.

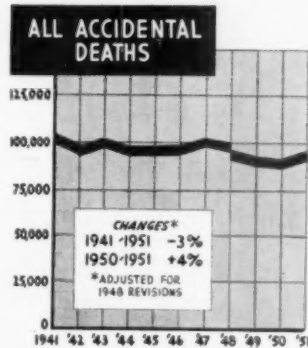
Nonfatal injuries increased to an estimated total of 2,100,000 in 1951, compared with 1,950,000 in 1950, an 8 per cent rise. Permanent impairments numbered about 90,000, or 5,000 more than in 1950.

Employment in all industries during 1951 increased about 2 per cent above the 1950 figure. In manufacturing alone, employment increased about 8 per cent.

Accident rates cannot be computed at this time on a national basis, but preliminary information indicates that the all-industry frequency rate probably was somewhat higher than in 1950. Nonfatal injuries, as noted above, increased about 8 per cent. The number of workers increased 2 per cent, and average hours worked went up a little but probably no more than 1 per cent. The increase in exposure, then, was appreciably less than the increase in injuries.

Accident Costs

Wage loss, medical expense, and the overhead cost of insurance for occupational accidents in 1951 amounted to about \$1,300,000,000. The so-called "indirect" costs also totalled about \$1,300,000,000, including such items as time lost by



workers other than the injured, interference with production schedules, property damage, and partial disability due to accidents which did not result in lost time. Total costs thus were about \$2,600,000,000.

Off-the-Job Accidents

In addition to the occupational accidents, the nation's productive capacity was lowered by off-the-job accidents of workers. The 1951 death toll from these accidents was approximately 34,000 and the injury total about 2,600,000. Accidents to workers, on and off the job, thus totalled 50,000 deaths and 4,700,000 injuries. The time lost during the year from these accidents, and from less serious injuries and indirect losses, amounted to approximately 340,000,000 man-days.

Industrial Commission Records

Deaths reported to Industrial Commissions in 25 states during 1951 totalled 8,310, or about 9 per cent

more than were reported in 1950. Increases of 1 to 36 per cent were recorded in 21 states, and decreases of 6 to 15 per cent in 3 states. One state reported no appreciable change from 1950.

	1951	1950	Per Cent Change
Totals for 25 states	8,310	7,604	+9
Alabama	111	95	+17
Arizona	67	71	-6
California	979	832	+18
Conn. (11 Mos.)	46	45	+2
Florida (10 Mos.)	163	121	+35
Georgia (11 Mos.)	128	115	+11
Idaho	80	60	+33
Illinois	528	428	+23
Kansas	84	99	-15
Kentucky	91	67	+36
Maryland	140	135	+4
Massachusetts	467	462	+1
Missouri	97	77	+26
Nebraska (11 Mos.)	65	62	+5
New York (7 Mos.)	1,152	1,020	+13
North Carolina	163	148	+10
Ohio	1,180	1,123	+5
Oregon (11 Mos.)	141	139	+1
Pennsylvania	941	910	+3
South Carolina	75	68	+10
Texas	650	574	+13
Virginia	225	208	+8
Washington	246	241	+2
West Virginia	334	335	0
Wisconsin	150	100	-6

Railroad Accidents

Deaths of railroad employees on duty, excluding those occurring more than 24 hours after the injury, numbered 249 in the first eight months of 1951, an increase of 19 per cent from 1950. Injuries with more than three days' disability numbered 15,407, or 16 per cent more than in 1950.

Coal Mine Accidents

Deaths in coal mine accidents in 1951 totalled 790, or 23 per cent more than in 1950, according to a preliminary report of the U. S. Bureau of Mines. The death rate per million tons of coal mined rose 19 per cent, from 1.15 in 1950 to 1.37 in 1951. The 1950 rate was the lowest on record. Falls of roof or face accounted for 46 per cent of the 1951 deaths, gas and dust explosions for 21 per cent and haulage accidents for 15 per cent.

Fire Loss

The 1951 total of property destroyed by fire was \$731,000,000, according to the National Board of Fire Underwriters. This was 6 per cent more than the comparable 1950 total. In 1950, over half of the loss from building fires was in industrial and business establishments.

THE NATIONAL ACCIDENT FATALITY TOLL

	1951	1950	Per Cent Change
All Accidents	93,000	89,000	+4
Motor-vehicle	37,500	35,000	+7
Public non-motor-vehicle	15,000	14,000	+7
Home	27,000	27,000	0
Occupational	16,000	15,500	+3

Note: The motor-vehicle totals include some deaths also included in the occupational and home totals. This duplication amounted to about 2,500 deaths in each year. All figures are National Safety Council estimates.

safety

occupational
**SAFETY
POSTERS**

POSTERS



For Your Information

**cleaning time
is ALL the time**



For

A BETTER PLACE TO WORK!

9533-C

25x38

Above new "C" poster, issued monthly, is indicative of the other two color posters—shown in black and white on the following pages and in the 1952 Poster Directory.

ABOVE is a reproduction of the 1952 Directory of Occupational Safety Posters—copies of which have been mailed to all National Safety Council industrial members. This new Directory contains miniatures of 744 posters—top-notch selections on a great variety of subjects. Additional copies are available at 50 cents each, by writing the Membership Dept., N.S.C.

Posters miniatures on this page and the two following are NEW—produced for the first time this month. Excepting the Jumbo poster (below, left) all will be in stock throughout 1952. The posters shown in black-and-white on the two following pages are actually printed in two or more colors.

MAKE THE MOST OF YOUR POSTER SERVICE by selecting from the brand new posters shown on these pages each month and from the hundreds of illustrations in the 1952 Directory.



JUMBO POSTER, 60" APRIL 1952

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".



9472-A

8½x11½

This new four color poster is illustrative of the 72 four color posters shown in the 1952 Poster Directory.

Electrotypes of poster miniatures on this page are not available, nor can payroll inserts be supplied.

Posters below are printed in two or more colors
(Available only in sizes indicated)



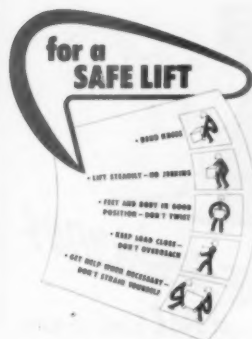
NATIONAL SAFETY COUNCIL
9478-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL
9524-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL
9446-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL
9383-B 17x23



NATIONAL SAFETY COUNCIL
9477-A 8 1/2 x 11 1/2



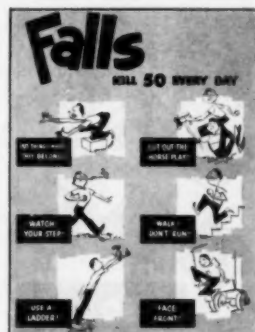
USE EYE PROTECTION KEEP GUARDS IN PLACE
NATIONAL SAFETY COUNCIL
9500-B 17x23



NATIONAL SAFETY COUNCIL
9520-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL
9501-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL
9531-B 17x23

Electrotypes of payroll inserts can be furnished on all poster illustrations shown above.

Posters below are printed in two or more colors
(Available only in sizes indicated)



NATIONAL SAFETY COUNCIL

9399-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL

9518-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL

9424-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL

9493-B 17 x 23



NATIONAL SAFETY COUNCIL

V-9516-B 17 x 23



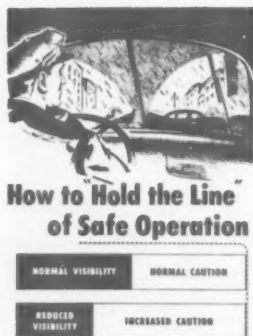
NATIONAL SAFETY COUNCIL

V-9513-B 17 x 23



NATIONAL SAFETY COUNCIL

V-9515-A 8 1/2 x 11 1/2



NATIONAL SAFETY COUNCIL

V-9514-B 17 x 23

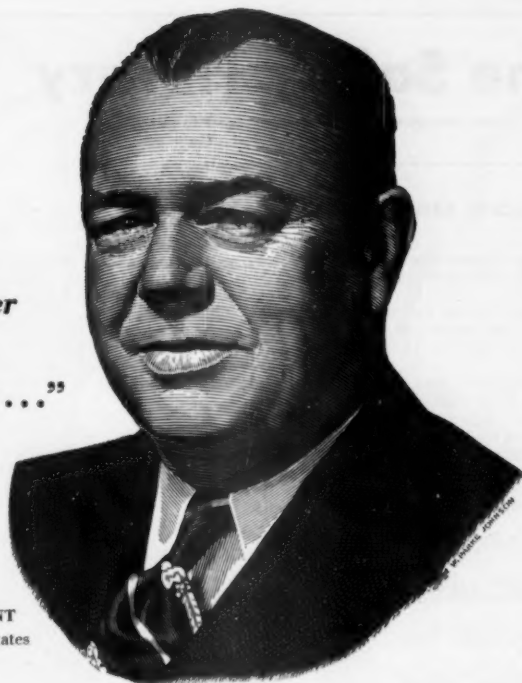


NATIONAL SAFETY COUNCIL

V-9512-A 8 1/2 x 11 1/2

Electrotypes of payroll inserts can be furnished on all poster illustrations shown above.

***"I urge every
American employer
to promote the
Payroll Savings Plan..."***



DECHARD A. HULCY, PRESIDENT
Chamber of Commerce of the United States

***"I urge every American employer to promote the Payroll Savings Plan among
his employees as a means of building a reservoir of savings."***

As President of the Chamber of Commerce of the United States... with literally thousands of contacts throughout industry and commerce... Mr. Hulcy is uniquely qualified to evaluate the Payroll Savings Plan.

As a business man, Mr. Hulcy puts his finger on a most important accomplishment of the Payroll Savings Plan: the enormous reservoir of savings, *future purchasing power*, built up by systematic saving.

Today, millions of Americans hold Series E Defense Bonds totaling \$34.7 Billion. It will surprise many to learn that this figure is \$4.8 Billion greater than on V.J. Day. And the \$34.7 Billion total of outstanding Defense Bonds is mounting as more and more employers recognize the importance of the Payroll Savings Plan. During 1951 there was a sizable increase in the number of men and women saving through Payroll Saving Plans where they work.

During the calendar year 1951, 45,500,000 \$25 Series E Bonds were purchased — a gain of 17% over the previous year. 12,000,000 \$50 E Bonds were purchased in the same period, 14% over the previous year. \$25 and \$50 denominations are the bonds bought by Payroll Savers.

Building a reservoir of savings and future purchasing power... contributing to America's defense effort... helping to maintain America's economic stability by providing a check on inflationary tendencies, the Payroll Savings Plan is doing a three-way job.

If your company hasn't a Payroll Plan, or if your employee participation is less than 60%, the Savings Bond Division, U. S. Treasury Department will be glad to help you take your place among America's Honor Roll of "Companies on Payroll Savings". Phone, wire or write to Suite 700, Washington Building, Washington, D. C.

The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

NATIONAL SAFETY COUNCIL



The Safety Library

Books, Pamphlets and Periodicals of Interest to Safety Men

MAGAZINE ARTICLES

Aeronautics

CAA Crash Studies Give New Safety Data. (In Aviation Week. Jan. 21, 1952 p. 20).

More Money Slated for Transport Safety by F. Lee Moore (In Aviation Week. Jan. 14, 1952 p. 12).

Chemicals

Sodium Chlorate—How to Handle It Safely. By E. Mattair (In the Paper Industry Jan. 1952 p. 1187).

Tetryl Toxicity. A Summary of Ten Years' Experience. By Barton B. Bergman. (In A.M.A. Archives of Industrial Hygiene and Occupational Medicine. Jan. 1952 p. 10).

Construction

What Can I Do About Safety. By John A. Volpe (In Construction Methods and Equipment Jan. 1952 p. 51).

Eyes

Conditions Affecting Visual Efficiency in the Railroad Industry. By Derrick Vail. (In Industrial Medicine and Surgery Jan. 1952 p. 9).

The Dollars and Sense of Sight Conservation. By Lowell F. Johnson. (In Supervision Jan. 1952 p. 20).

Fire Protection

Crankcase Explosions. By G. W. Ferguson. (In SAE Journal Dec 1951 p. 47). (V. 59 No. 12 p. 47-48).

Explosion Injuries to 27 Firemen at 2-11 Alarm, Chicago Blaze. By Paul C. Ditzel. (In Fire Engineering Jan. 1952—p. 20).

How to Protect Open-Pit Equipment Against Lightning. By A. M. Opsahl. (In Engineering and Mining Journal Jan. 1952 p. 91) Vol. 153, No. 1 McGraw Hill—New York, N. Y.

New San Antonio Bus Terminal. Guards Against L.P.G. Hazards (In Fire Engineering Jan. 1952 p. 28).

Health

Differential Diagnosis of Sclerosis and Sillcosis. By L. E. Hamlin (In Industrial Medicine and Surgery. Jan. 1952 p. 1).

Further Investigations on Chronic Cadmium Poisoning by Lara Friker. (In A.M.A. Archives of Industrial Hygiene and Occupational Medicine Jan. 1952 p. 30).

Management of the Older Employee with Medical Problems. By Rufus Baker Crain. (In A.M.A. Archives of Industrial Hygiene and Occupational Medicine Jan. 1952 p. 71).

A Study of Influenza Vaccination

in an Industrial Plant. By George P. Eddy. (In Industrial Medicine and Surgery Jan. 1952 p. 15).

Your Foreman Will Work with You. By Eve Morkill. (In American Journal of Nursing Jan. 1952 p. 69).

Mines

Dust and Fume Control. By L. H. McGuire. (In Coal Age Jan. 1952 p. 108. Vol. 57—No. 1. 108-110 Fire?)

Paper Industry

Paperboard-Container-Industry-Work-Injury Rates, 1938-50 (In Monthly Labor Review—Dec. 1951 p. 675).

Power Presses

Individual Plastic Die Guards — Part of Allis-Chalmers Power Press Guarding Program. By R. F. Thuma (In Machine and Tool Blue Book Jan. 1952 p. 138).

Safety for Power Press Die Setters. (In Safety Standards Jan. 1952 p. 1).

Textile Industry

This Safety Program Really Pays Off (In Textile World Jan. 1952 p. 153).

Ventilation and Exhaust Systems

Exhaust Ventilation for Machine Tools. Used on Materials of High Toxicity. By H. F. Schulte. (In A.M.A. Archives of Industrial Hygiene and Occupational Medicine. Jan. 1952 p. 21).

Waste Disposal

Radioactive Waste Disposal. By Walton A. Rodger and Philip Fine-man (In Chemical Engineering Dec. 1951 p. 146).

BOOKS AND PAMPHLETS

Atmospheric Pollution

Air Pollution Abatement Manual. Chapter 5. Physiological Effects. 28 p. 60¢. Chapter 8. Analytical Methods 15 p. 35¢. Published by Manufacturing Chemists Association, 246 Woodward Bldg., Washington 5, D. C. 1951.

Chemicals

Handling Metallic Sodium. Published by National Distillers Chemical Co., Ashtabula, Ohio, 1951. 24 p. Free.

Sodium Chlorate. Published by Manufacturing Chemists Association, 246 Woodward Bldg., Washington 5, D. C. 1951. 11 p. Price 25¢ (Chemical Safety Data Sheet SD-42).



Civil Defense

Fire Services. Published by Federal Civil Defense Administration 1951. 27 p. For sale by the Superintendent of Documents, Washington 25, D. C. Price 15¢ (AG-9-1).

Outdoor Warning Device Systems. Published by Federal Civil Defense Administration 1951. 35 p. For sale

—To page 260

AND HERE'S

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Training Aids

—From page 209

Publications

Photoescripts are give-away booklets for the workers—to teach safety with pictures. Actual on-the-scene photos make these training aids realistic and convincing.

The Safe Worker is a monthly publication for employees that has proved popular wherever circulated. Humorously written and illustrated, it covers seasonal and general safety themes. Workers in the transporta-

tion fields get similar publications called *The Safe Driver* and *The Safe Railroader*.

Numerous miscellaneous booklets published by the National Safety Council cover health and off-the-job subjects and are designed specifically for the worker.

The Industrial Supervisor each month provides help for the foreman in meeting his safety and training problems, offering articles and features on technical and human relations subjects, safety talks, how-to-do-it features and the like.

Other special publications for foremen include a series of 12 pamphlets

on "Safety in Foremanship," six pamphlets on "Psychology of Safety in Supervision," and volumes of suggested five-minute talks for the foreman to use "as is" or as the pattern for his own version of each subject.

For key personnel interested in the broader aspects of the safety program there is the *Accident Prevention Manual for Industrial Operations*, a cloth-bound volume of 812 pages, covering the essentials of a complete safety program. *National Safety News* brings each month 100 or more pages of factual data and stimulating articles on accident problems, health and hygiene, as well as news about people, products and events in the field of safety.

Specific accident prevention problems of different industries are covered in the monthly *Sectional News Letters*, and numerous other books and pamphlets provide helpful guidance in accident recording and analysis and safety education and promotion. Among these is *Accident Facts*, the annual roundup of accident experience throughout the country, giving summaries, analyses, rates charts and tables.

Safe Practices Pamphlets and *Health Practices Pamphlets* offer important additions to each safetyman's library. Covering more than 140 subjects, these pamphlets are detailed studies of operations important to safety supervisors, and they reflect the collective experience of hundreds of member companies.

Industrial Data Sheets offer concise, authoritative discussions on specific safety subjects. They, like the pamphlets, are furnished separately or as full sets in ring binders. *Detail Sheets* offer working drawings for construction of temporary structures or safety devices that any workman can follow.

Special releases include *Accident Facts Memos*, *Engineering Studies* and *Safety Reprints* covering a wide range of subjects.

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The Safety Library

—From page 256

by the Superintendent of Documents, Washington 25, D. C. Price 15¢ (TM-4-1).

Construction

Safety Suggestions for Construction Foremen. Published by Kemper Insurance, 4750 N. Sheridan, Chicago, Ill. 1951. 27 p. Free.

Elevators

Elevator, Dumbwaiter and Moving Stairway. Accident Report 1949-1950. Published by Otis Elevator Co., New York, N. Y. 1951. 21 p. Free.

Fire Protection

Employee Organization for Fire Safety. Published by National Fire Protection Association, 60 Battery-march Street, Boston, Mass. 1951. 42 p. Price 50¢.

Fire Research 1950. Published by Department of Scientific and Industrial Research and Fire Officers Committee 1951. 49 p. Available from British Information Service, 30 Rockefeller Plaza, New York 20, N. Y. 65¢.

Report of the Fire Research Board. With the report of the Director of Fire Research for the year 1950. Besides the usual fire statutes and causes it includes information on television sets and fluorescent lighting, and the structural aspects of fires in buildings.

Report of the Ammonium Nitrate Working Party. Published by His Majesty's Stationery Office 1951. 50 p. Available from British Information Service, 30 Rockefeller Plaza, New York 20, N. Y. 65¢.

Mines

Federal Coal-Mine Inspection. A Decade of Progress. Annual Report for Fiscal Year 1951 and 10-year Review. Published by U. S. Bureau of Mines. 1951. 47 p. Available from the Bureau, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. Free (Information Circular 7625).

Minimizing Fire Hazards in Coal Mines by Proper Circuit-Breaker Protection of 250/275 volts. By F. G. Gallagher. Published by U. S. Bureau of Mines. 1951. 11 p. Available from the Bureau, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa. (Information Circular 7624).

Some Practical Aspects of Coal-Mine Ventilation. By R. T. Arts. Published by U. S. Bureau of Mines. 1951. 45 p. For sale by the Superintendent of Documents, Washington 25, D. C. Price 55¢. (Handbook).

Power Presses

Power Presses. A Comparison of State Safety Codes with ASA Code B 11.1—1948. Published by U. S. Bureau Labor Standards. Washington 25, D. C. 1951. 32 p. Free.

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COMING EVENTS

In the Field of Safety

Apr. 1-4, New York

Twenty-second Annual Convention, Greater New York Safety Council, (Hotel Statler). Paul F. Stricker, executive vice-president, 60 E. 42nd St., New York 17, N. Y.

Apr. 7-10, Detroit, Mich.

Twenty-second Annual Meeting, Michigan Safety Conference, (Hotel Statler). Frederick K. Krupp, executive secretary, 174 East Atwater Street, Detroit 26, Mich.

Apr. 9-10, Louisville, Ky.

Seventh Statewide Safety Conference and Exhibit. (Kentucky and Seelbach Hotels). Estel Hack, managing director, Louisville Safety Council, Speed Bldg., Louisville 2, Ky.

Apr. 15-17, Buffalo, N. Y.

Twelfth Western New York Safety Conference and Exhibit. (Statler Hotel). Earl L. Hubbard, 150 Warren Ave., Kenmore, N. Y.

Apr. 15-17, Columbus, Ohio

Twenty-second All-Ohio Safety Congress and Exhibit. (Deshler Wallick Hotel). James H. Fluker, superintendent, Division of Safety and Hygiene, Industrial Commission of Ohio, Columbus 15, Ohio.

Apr. 15-17, Pittsburgh, Pa.

Twenty-seventh Annual Western Pennsylvania Safety Conference. (William Penn Hotel.) Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, 605 Park Bldg., Pittsburgh 22, Pa.

Apr. 16-18, Charleston, W. Va.

Eighteenth Annual West Virginia Safety Conference. (Daniel Boone Hotel). Mrs. W. C. Easely, acting managing director, West Virginia Safety Council, 316 Masonic Bldg., Charleston 1, W. Va.

Apr. 21-22, Toronto, Ont.

Industrial Accident Prevention Association, Annual Conference. (Royal York Hotel). R. G. D. Anderson, general manager, Industrial Accident Prevention Associations, 600 Bay St., Toronto 2, Ont.

Apr. 22-23, Fort Wayne, Ind.

Ninth Annual Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, manager, Safety Council, Chamber of Commerce, Fort Wayne 2, Ind.

Apr. 23, Bridgeport, Conn.

Seventh Annual Connecticut Industrial Safety Conference. (Hotel Stratfield). A. M. Addison, manager,

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Connecticut Safety Society, c/o Connecticut State Highway Dept., Hartford, Conn.

May 4-6, Asheville, N. C.

Twenty-second Annual North Carolina Statewide Industrial Safety Conference. (George Vanderbilt Hotel). H. S. Baucom, safety director, North Carolina Industrial Commission, Raleigh, N. C.

May 6-8, Chicago

29th Annual Midwest Safety Show, (Congress Hotel). Joseph F. Stech, Manager, Greater Chicago Safety Council, Suite 806, 10 N. Clark St., Chicago 2.

May 6, Easton, Pa.

Twenty-fifth Annual Eastern Pennsylvania Safety Conference. (Hotel Easton). Harry C. Woods, executive secretary, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

May 8-9, Baltimore, Md.

Statewide Safety-Health Conference and Exhibit. (Lord Baltimore Hotel). Joseph A. Haller, director of safety, State Industrial Accident Commission, Equitable Bldg., Baltimore 2, Md.

May 15-17, Richmond, Va.

Eighteenth Annual Virginia Statewide Safety Conference. (Jefferson Hotel). William M. Meyers, executive secretary, Richmond Safety Council, 803 1/2 E. Main St., Richmond 19, Va.

May 22-23, Duluth, Minn.

Twenty-eighth Annual Conference, Lake Superior Mines Safety Council. (Hotel Duluth). John A. Johnson, chief, Accident Prevention and Health Division, Region V, U. S. Bureau of Mines, 18 Federal Bldg., Duluth, Minn.

May 27-29, St. Louis, Mo.

Central States Safety Conference. (Hotel Jefferson). Reyburn Hoffman, secretary-manager, Safety Council of Greater St. Louis, Room 820, 511 Locust St., St. Louis 1, Mo.

May 29-31, Vancouver, B. C.

Forest Products Safety Conference. (Vancouver Hotel.) R. E. Evans, secretary, British Columbia Forest Products, Ltd., 995 W. Sixth Ave., Vancouver 9, B. C.

June 2-4, Washington, D. C.

President's Conference on Industrial Safety. (Department of Labor Bldg.) William L. Connolly, chairman, Coordinating Committee, Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C.

June 16-18, Long Beach, Calif.

Western Safety Conference. Joseph M. Kaplan, secretary-manager, Greater Los Angeles Chapter, National Safety Council, Suite 730, 610 South Main St., Los Angeles 14, Calif.

Sept. 11-12, York Harbor, Me.

Twenty-fifth Annual Maine State Safety Conference. (Marshall House).

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Electric Equipment

—From page 178

Snap switches, such as pushbutton or toggle types, usually have all live parts enclosed. Flush switches should be installed in metal boxes, and surface switches used in open wiring and moulding work should be mounted on porcelain or composition sub-bases. These switches should indicate whether the circuit is open or closed.

Snap switches are preferable to key or pull-chain sockets. If key sockets are used, porcelain, plastic, or other non-conductive types are recommended. Pull-chains should contain non-conductive links.

Protection against accidental shock from live electric parts, such as switchboards, fuse panels, and control equipment is obtained by insulating the floor area within reach of live parts.

For low-voltage exposures, dry wood floors without metal parts, or insulating mats, may be used. Material for mats should be non-conductive, moisture resistant, and able to withstand mechanical abuse in service.

Cords, Sockets, Lamps

Extension cords should be of a type listed by Underwriters' Laboratories and labeled to show compliance with all requirements of the National Electrical Code. They should be inspected regularly. Kinking or excessive bending of cords should be avoided.

Ordinary lamp cord should not be used where it will be exposed to mechanical wear or to moisture—never for extension lamps in boilers, tanks, or on damp or metal floors.

Cord for portable tools and equipment is made in several grades. Rubber-sheathed cord should be used with tools and lamps in boilers, tanks and other grounded enclosures.

For heating devices, such as electric irons and water heaters, the cord has an insulating covering containing flameproofing material such as asbestos fiber. It resists high temperature but not dampness.

Sockets should be of porcelain, non-conducting plastic, or rubber covered. Ungrounded metal-shell sockets are not recommended.

Extension lamps are sometimes used under conditions where a shock of 110 volts might be fatal. Safe cords and lamp holders must be provided and maintained in good condition. Handles should be of non-conducting material and there should be no metallic connection between the lamp guard and the socket shell.

Miniature voltage. Portable transformers which step the lamp voltage down to 6 volts are frequently used where the shock hazard is serious.

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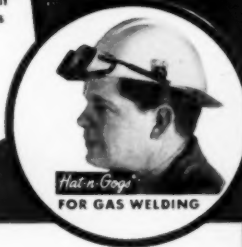
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CESCO



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BIRMINGHAM, ALA.
Guardian Safety Equipment Co.
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Williams & Co., Inc.
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Averill Equipment Company
19225 Conant Avenue

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Guardian Safety Equipment Co.
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KANSAS CITY, MO.
Safety, Incorporated
1715 E. 31st Street

KNOXVILLE, TENN.
Safety Equipment Distributing Co.
832 W. Main Street

LITTLE ROCK, ARK.
Fire Appliances & Safety Co.
1114 W. Markham

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6104 S. Main Street

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3155 S. 7th Street

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Universal Safety Equipment Co.
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Guardian Safety Equipment Co.
214 S. 45th Street

PITTSBURGH, PA.
Williams & Co., Inc.
901 Pennsylvania Avenue

ST. LOUIS, MO.
Safety, Inc.
2608 Olive Street

ST. PAUL, MINN.
Continental Safety Equipment, Inc.
1551 Selby Ave.

SALT LAKE CITY, UTAH
Universal Fire & Safety
Equipment Co., Box 1507

SAN FRANCISCO, CALIF.
Guardian Safety Equipment Co.
50 Hawthorne Street

SPOKANE, WASH.
Spokane Safety Appliances
W. 310 Pauls Ave.

TOLDO, OHIO
Williams & Co., Inc.
650 E. Woodruff Avenue

TULSA, OKLA.
Guardian Safety Equipment Co.
1742 S. Main Street

MEXICO CITY, D. F.
Safety Equipment S. A.
Paseo de la Reforma 1-856

MONTREAL, CANADA
The Butler Optical Company, Ltd.
1520 Mountain Street

CHICAGO EYE SHIELD COMPANY • 2306 Warren Boulevard, Chicago 12, Illinois



CESCO FOR SAFETY

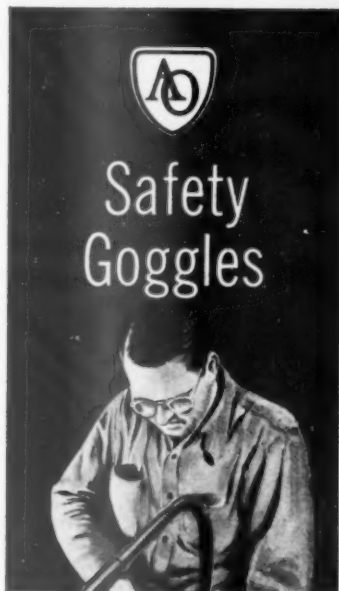
For Workers Who Need
a **LIGHTWEIGHT,
STRONG, DURABLE,
GOOD LOOKING**
Acetate Goggle...



the **AO F9200** is the Buy!

The AO F9200 Ful-Vue affords the highest quality eye protection against flying particles coming from the front, and is available with side shields when foreign objects endanger from the side. While used throughout industry in machine and hand tool work, chipping, grinding, riveting, bottling and welding with the recommended Calobar lenses, the goggle fills a particular need in chemical and electrical plants and other operations where sparks are fire and explosion hazards. Your nearest AO Safety Products Representative can supply you.

Remember whether the hazard is particles from the work, glare, heat, ultraviolet or infrared, cinders, dust or wind there is an AO Goggle that meets the need.



QUICK FACTS

- Hinges and temples out of line of sight, for unobstructed side vision.
- Face formed keyhole bridge for extra protection and comfort.
- Lenses conform to and cover eye orbit for safety, better vision, appearance.
- Nose pads designed to hold goggle firmly and comfortably. **FOR ADJUSTABLE PADS FOR HARD-TO-FIT WORKERS ASK FOR NEW AO FX9200 goggle.**
- Available with comfort cable or skull temples. Former have metal core; are enclosed and sealed. Skull temples have extra strong wire core encased in acetate.
- Side shields are perforated acetate to help keep lenses fog-free.
- 6 curve super armorplate clear or Calobar lenses in medium, dark or extra dark shades... ground to the worker's own prescription if desired.



SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES